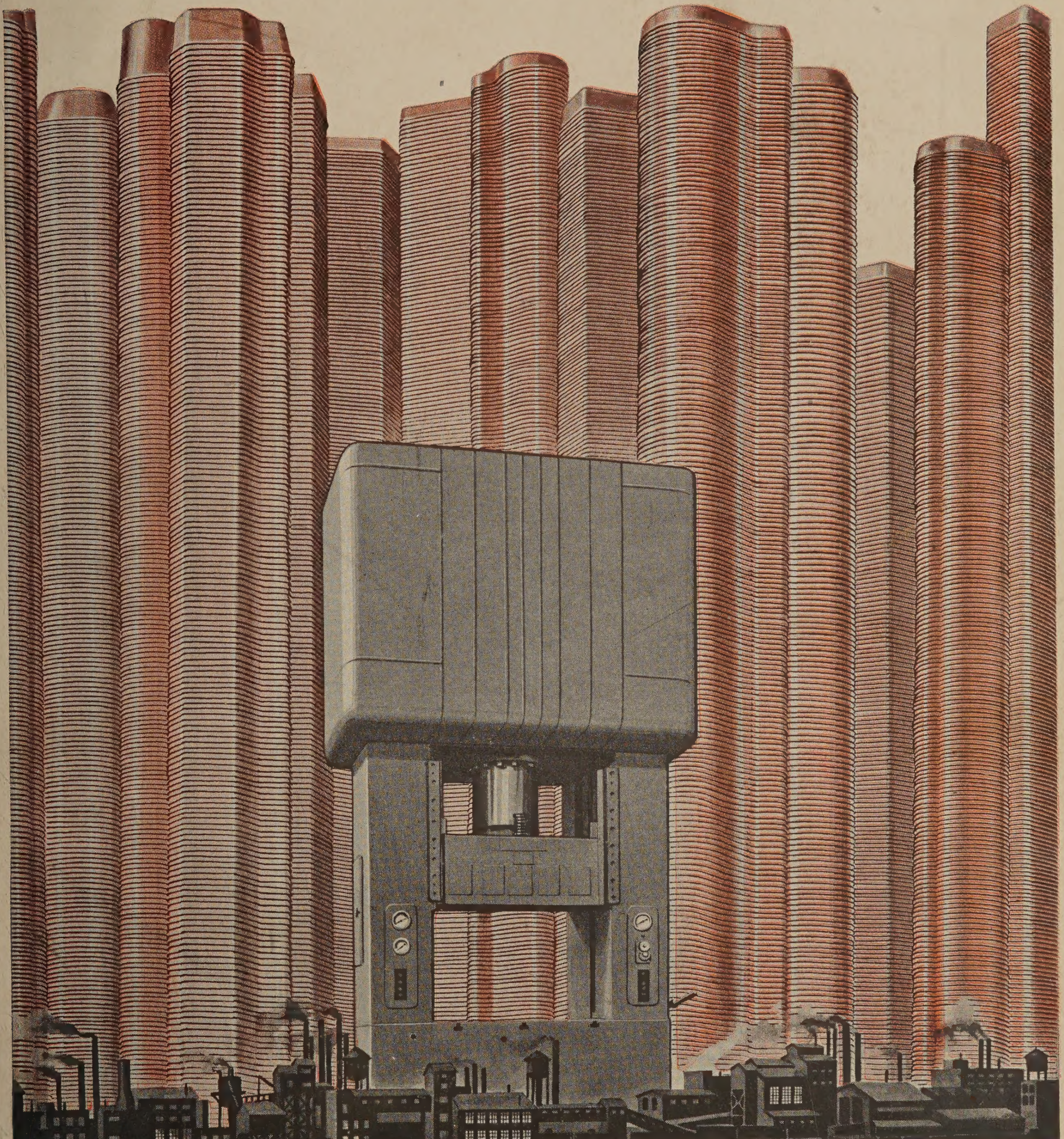
ents—p. 57
Babbitting Methods—p. 62
Powder Production—p. 70
ating 24S and 75S Sheet—p. 73
Structural Steels—p. 80
h Steel Allocations—p. 111
cal Material Stockpile—p. 114
Plant Helps Town—p. 116

Illinois U Library

The IRON AGE

DECEMBER 25, 1947



EXTENDING PRODUCTION & PROFIT HORIZONS

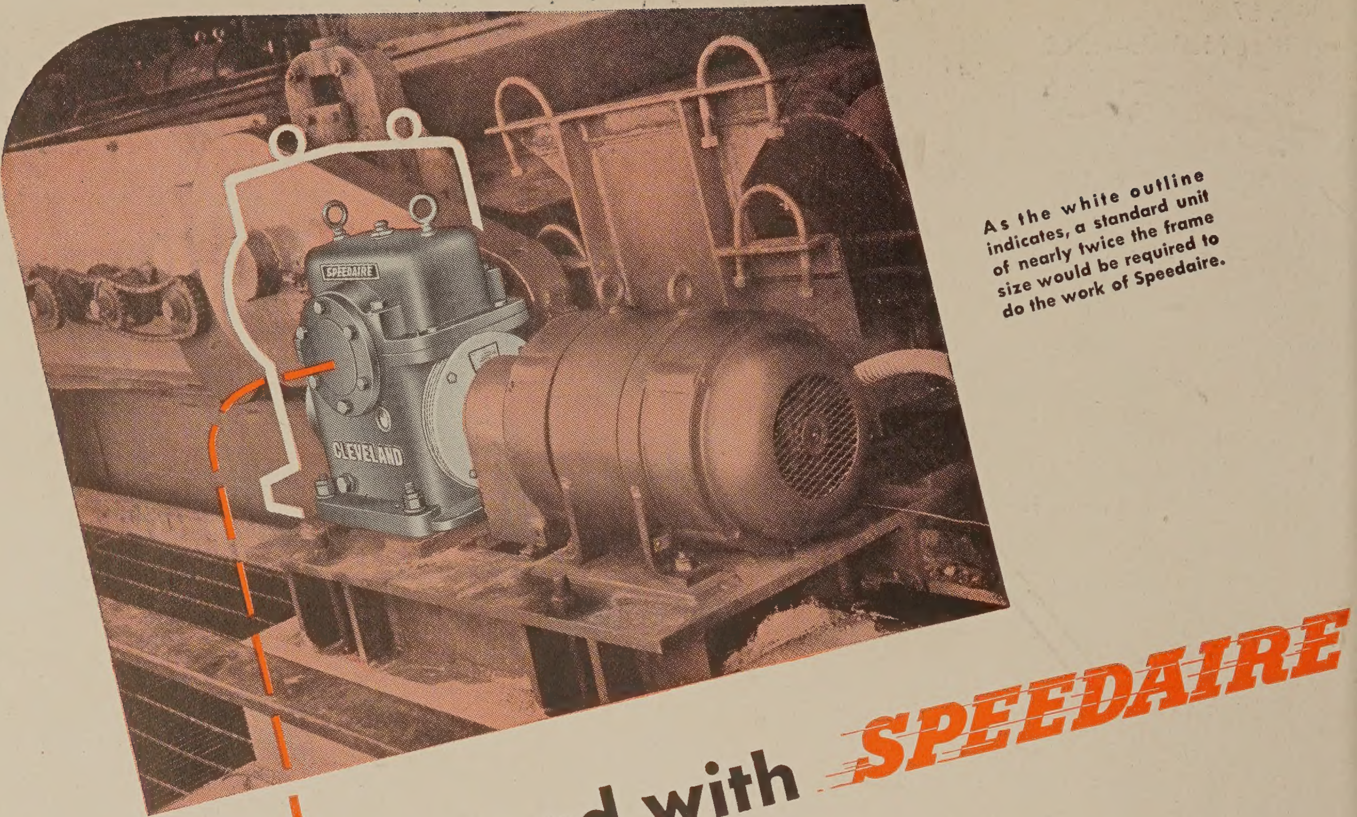
To produce *more* goods, of *higher* quality, with *fewer* operations, at *better* profits—use a Baldwin hydraulic press.

THE BALDWIN LOCOMOTIVE WORKS, PHILADELPHIA 42, PA., U. S. A. Offices: Birmingham, Boston, Chicago, Cleveland, Houston, New York, Philadelphia, Pittsburgh, San Francisco, Seattle, St. Louis, Washington.

BALDWIN

BLW THE BALDWIN GROUP

HYDRAULIC PRESSES



As the white outline indicates, a standard unit of nearly twice the frame size would be required to do the work of Speedaire.

28% of cost saved with SPEEDAIRE

THIS Speedaire is installed in a well-known Ohio steel mill. It drives the rolls of a pickler through which steel sheets pass before hot dip galvanizing.

In selecting Speedaire for this job, the company saved three ways: It *saved dollars*—28% of the cost of a standard worm-gear speed reducer. It *saved weight*—36.6% of the floor load. And it *saved space*—50% of the room required to accommodate a conventional unit.

Speedaire is Cleveland's new fan-cooled worm-gear speed reducer. Because it is fan-cooled, Speedaire will do more work—will deliver up to *double the horsepower* of standard worm units of equal frame size, at usual motor speeds. It can be installed economically on many applications where other types have been used heretofore—giving you the advantages of a compact right-angle drive. Speedaire gives the same long, trouble-free service characteristic of all Clevelands.

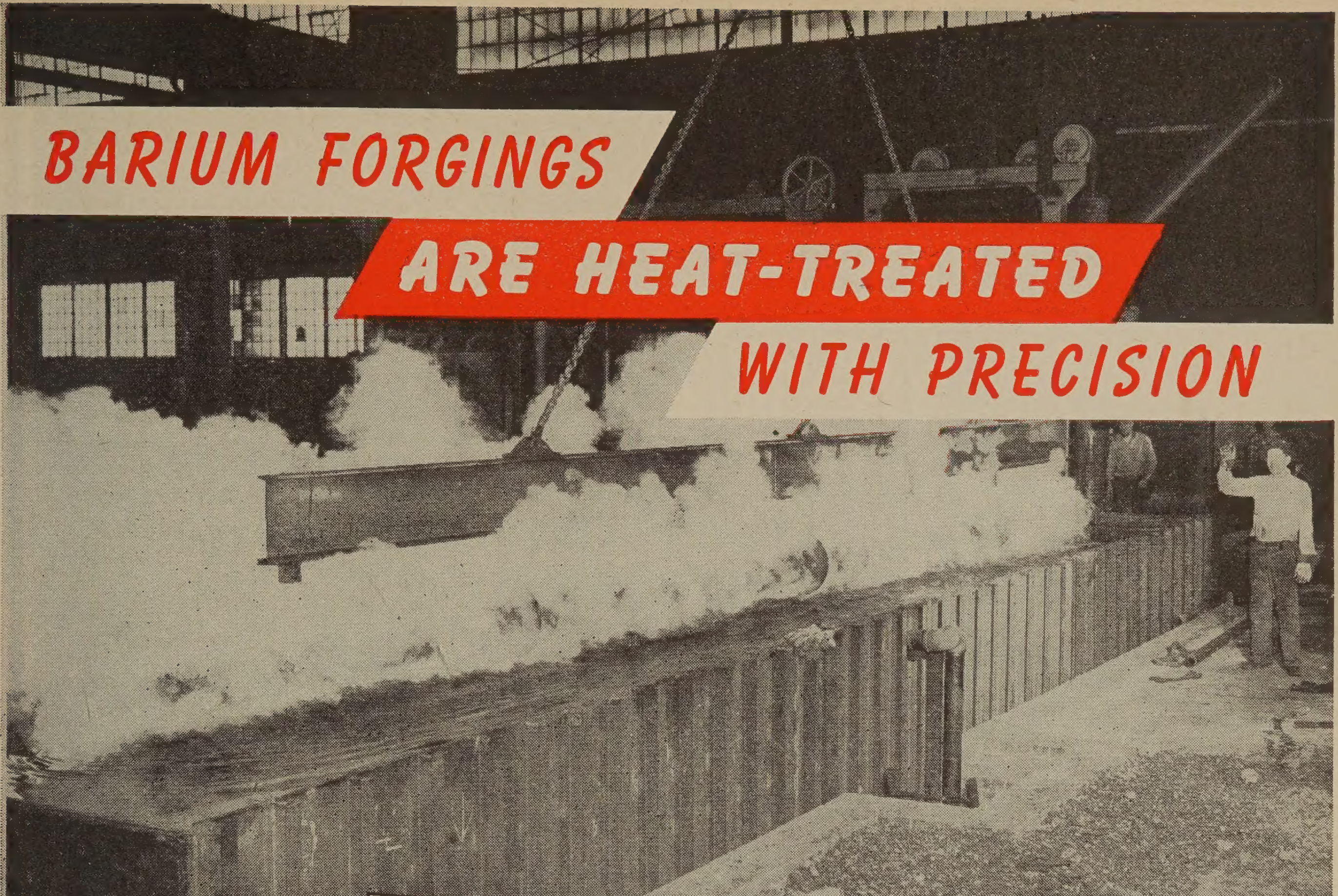
For full description, send for Catalog 300. The Cleveland Worm & Gear Co., 3252 East 80th St., Cleveland 4, Ohio.

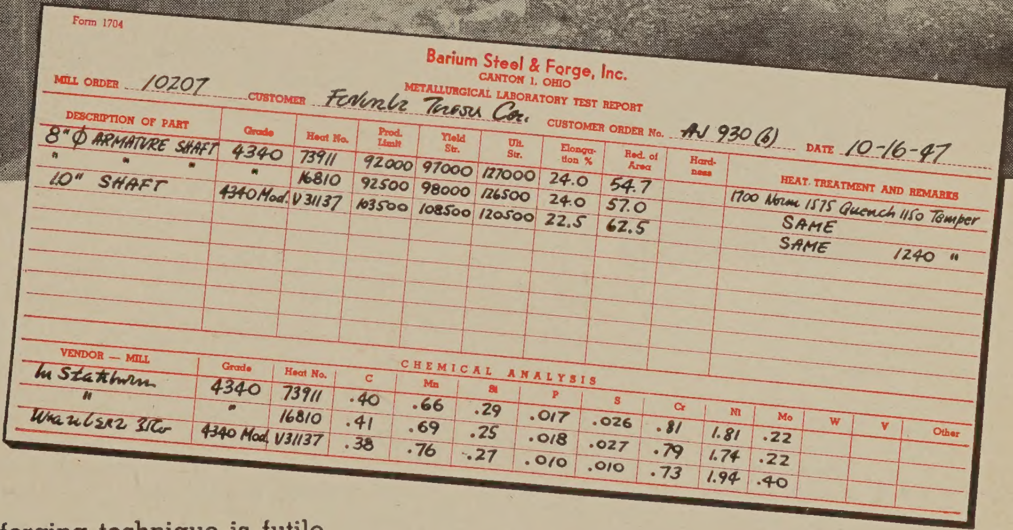
Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Speed Reducers

THE IRON AGE, published every Thursday by the *CHILTON CO. (INC.),* Chestnut and 56th Sts., Philadelphia 39, Pa. Entered as second class matter Nov. 8, 1932, at the Post Office at Philadelphia under act of March 3, 1879. $8 yearly in United States, its territories and Canada; other Western Hemisphere Countries $15; other Foreign Countries $20 per year. Single Copies 35¢. Annual Review Number, $2.00. Vol. 160, No. 26.

BARIUM FORGINGS ARE HEAT-TREATED WITH PRECISION





Form 1704

Barium Steel & Forge, Inc.
CANTON 1, OHIO
METALLURGICAL LABORATORY TEST REPORT

MILL ORDER 10207 CUSTOMER Fenwick Tresu Co. CUSTOMER ORDER No. AJ 930 (b) DATE 10-16-47

DESCRIPTION OF PART	Grade	Heat No.	Prod. Limit	Yield Str.	Ult. Str.	Elongation %	Red. of Area	Hardness	HEAT TREATMENT AND REMARKS
8" Φ ARMATURE SHAFT	4340	73911	92000	97000	127000	24.0	54.7		1700 Norm 1575 Quench 1150 Temper
" " "	"	16810	92500	98000	126500	24.0	57.0		SAME
10" SHAFT	4340 Mod.	V 31137	103500	108500	120500	22.5	62.5		SAME 1240 "

CHEMICAL ANALYSIS

VENDOR — MILL	Grade	Heat No.	C	Mn	Si	P	S	Cr	Ni	Mo	W	V	Other
In Stakhorn	4340	73911	.40	.66	.29	.017	.026	.81	1.81	.22			
"	"	16810	.41	.69	.25	.018	.027	.79	1.74	.22			
Wauhser Str	4340 Mod.	V31137	.38	.76	.27	.010	.010	.73	1.94	.40			

Shown here are a 5700 lb. prime mover shaft emerging from quench and a typical test report.

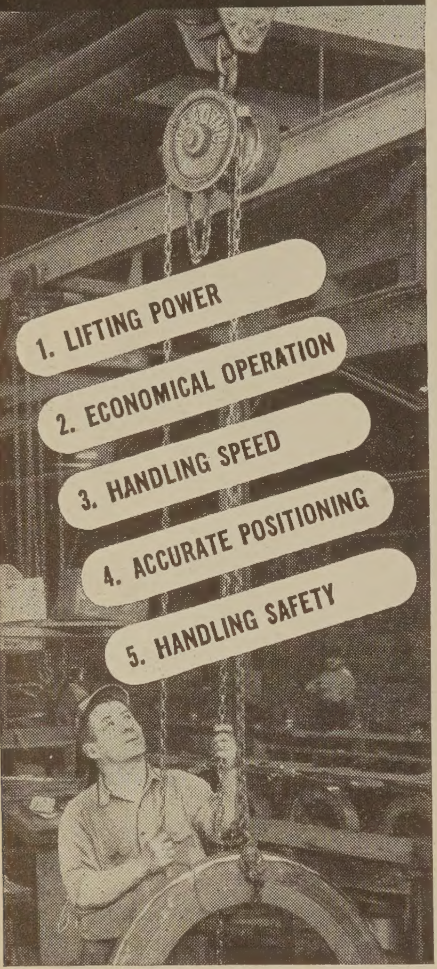
The most exacting forging technique is futile unless supplemented by equally precise heat treatment. Accurate heat treat control of large and small sections in every grade of alloy, stainless and tool steels is made possible by modern car type furnaces which handle work up to forty feet in length, eight feet in width and 50,000 lbs. weight; quenching tanks with adequate coolant reserves to handle these large masses; and close supervision by a fully staffed metallurgical department.

"If it's a forging you can buy it from Barium" and *KNOW THAT IT'S PROPERLY HEAT TREATED.* Send us your inquiry today.

Barium
STEEL & FORGE, INC.
CANTON 1, OHIO
SUBSIDIARY OF BARIUM STEEL CORPORATION

NEW YORK • BOSTON • PHILADELPHIA • CHICAGO
DETROIT • CLEVELAND • PITTSBURGH • BALTIMORE
CINCINNATI • ST. LOUIS • LOS ANGELES • HOUSTON

YOU GET ALL 5
WITH READING HOISTS



In your plant every piece of handling equipment should "pay its way" through efficient, economical operation. Reading Multiple Gear Hoists do just that.

Precision built spur gears are bathed in oil. You get economical operation, faster moving loads and accurate, safe handling of materials with Reading Hoists' sturdy construction and positive action friction brakes.

Give your plant these five important hoist advantages. Sizes are available for loads of from ¼ ton to 25 tons. For full details see your distributor or write us direct, today.

Have a materials handling problem in your plant? Send for our new, complete Chain Hoist Catalog No. 60.

READING CHAIN & BLOCK CORPORATION
2102 ADAMS ST., READING, PA.

CHAIN HOISTS • ELECTRIC HOISTS
OVERHEAD TRAVELING CRANES

READING HOISTS

Fatigue Cracks

BY C. T. POST

Hungry?

• • In the interests of getting what you expect when you order, we are happy to learn that Pittsburgh restaurants are leading the *Menus in English* movement. Some of the more advanced eateries, frequented by the city's newspapermen and Bohemian element, are taking no chances in getting across to the clientele just what's what.

Here are excerpts from an actual menu:

Bouillon of foul
Spanish omelette Spanish Style
Egg Omelette
Southern Fried Chicken Southern Style

We particularly commend the forthrightness on the soup course. The customer's got no kick coming when the chef admits everything in advance. We tried the bouillon. It was everything the menu said.

Worth Waiting For

• • We were all set for a plate of broiled salmon the other day when we walked into Churchill's Restaurant, hard by the Grand Central Airlines Terminal in New York City. We settled for a sirloin steak, though, as soon as we picked up the menu. The caption over the list of fish dishes was: "Our Seafood Is Strictly Made to Order."

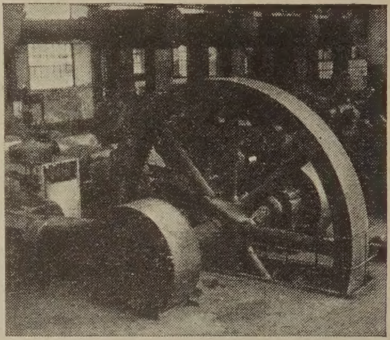
We could understand this offer on guppies, having just gotten a bigger goldfish bowl to house the offspring of the single pair we brought home a week ago. But if we had to dilly-dally with cocktails waiting for a tailor-made spawning season on the Columbia River, we'd say to hell with dinner about the time the obliging salmon climbed the fish ladder at Bonneville Dam.

Evil Eye?

• • Note to the Editorial Department: The readers are going to be at your throat soon if you don't dig up an article on industrial hypnotism. Outstanding as an author would be Olaf Nilson, Detroit tool and die shop operator. We see by the papers that the union, on strike at Nilson's shop, hauled him into court the other day seeking an injunction. Charge: "Seeking to mesmerize and hypnotize the pickets by staring steadily into the eyes of said pickets for periods up to 30 minutes." Nilson, the modest fellow, disclaims the whole thing.

Captious Captions

• • L. J. Hess, of Bethlehem's Sparrows Point plant, gets the sharp eyes award of the week for spotting a caption on page 121 of the December 4 issue, describing this photograph as a bank of huge steam turbines used in the manufacture of gas at Germany's Nord Deutsche Huette works.



Mr. Hess tut-tuts the editors for letting the caption get past them, remonstrating, "Doesn't your caption writer know the difference between a steam turbine and a gas compressor?" In view of the overwhelming circumstantial evidence, we are advising the caption writer, who works for an international photographic syndicate, to throw himself on the mercy of the court.

The caption that really troubled us, though, appeared on page 109 of the November 27 issue. That photograph clearly showed a group of Tournapulls, the big earth movers that close their jaws on a hunk of mountain, then scoot a couple of miles before disgorging. The caption was "Lined up in front of the Ministry of Agriculture, Budapest, are shown mechanical fertilizers from the United States." That, we thought, was spreading it on a little thick. Judging from the source of the photograph, it may have been communist propaganda, but we didn't expect the editors to swallow it.

Signs of the Times Department

• • Latest chapter on the housing situation is a four-line "Apartment Wanted" advertisement from the Berkeley, Calif., *Gazette:*

> GOING to be married soon. Need small apartment, preferably furnished. Will invite you to the wedding. Veteran student. References. Phone ———.

Bet an aggressive apartment house owner could get in on all sorts of good parties.

To all our good friends, old and new,
we express sincere appreciation for thoughtful consideration
and understanding accorded us throughout the year.
With assurance of our best efforts to serve you in days
to come, we send

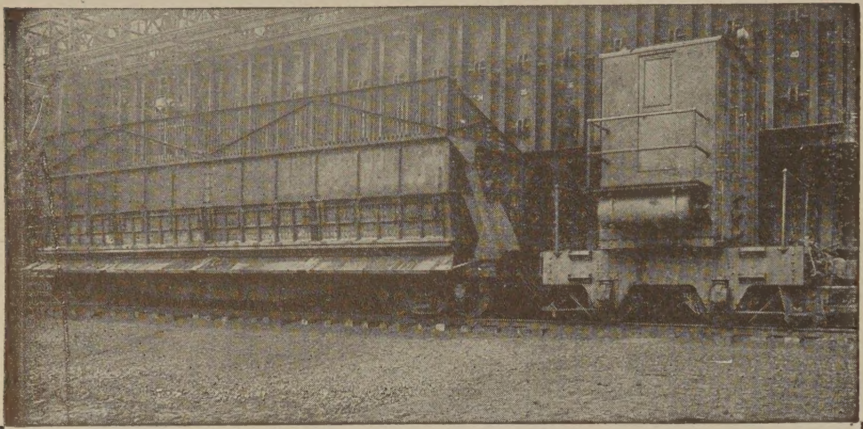
Season's Greetings

COLD ROLLED STRIP
POLISHED BLUE SHEETS
ELECTRICAL SHEETS
SEAMLESS TERNE ROLL ROOFING

FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES · PITTSBURGH 30, PA.
Sales Offices: New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee.
Sales Agents: Chicago, Indianapolis, St. Louis, Kansas City, Nashville, Houston, Los Angeles,
San Francisco, Seattle; Toronto and Montreal, Canada.
Plants: Follansbee, W. Va., and Toronto, Ohio.
Follansbee Metal Warehouses: Pittsburgh, Pa., Rochester, N. Y., and Fairfield, Conn.

COKE OVEN EQUIPMENT



QUENCHING CARS AND LOCOMOTIVES

All Atlas Coke Oven Equipment is of heavy-duty construction permitting the peak operating conditions required in today's stepped-up production schedules. As a result of years of experience, Atlas is able to design and build equipment, to meet the requirements of each particular coke plant. Detailed information available on request.

Other ATLAS Products

Ore Transfer Cars
•
Scale Charging Cars
•
Electrically Operated Cars for Every Haulage Purpose

Locomotives for Switching and Interplant Haulage
•
Turntables

The ATLAS CAR & MFG. CO.
ENGINEERS MANUFACTURERS
1100 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

Dear Editor:

GLASS WOOL CATHODE

Sir:

We noted recently a reference to an article on electrolytic polishing of stainless steel using a glass wool cathode. . . . This was a development or invention of M. Jacquet. We would appreciate more information about the process. . . .

A. W. KNIGHT
Vice President
William Allen Sons Co.
Worcester

● The cathode is not glass wool, but enclosed in glass wool, or some other moisture retentive material impervious to the electrolytic polishing solution. The use of this particular technique is for polishing some areas of heavy and cumbersome articles. It was developed at Frankford Arsenal in Philadelphia and you can secure more information by addressing an inquiry to them. M. Jacquet did not invent this particular type of selective polishing equipment. It is merely an adaptation of a procedure that has been used for electroplating or electrocleaning. So far as we know, this is the first use of the technique in electrolytic polishing. As you can see by having a small cathode enclosed with glass wool and by making a large casting, for instance, an anode, it is possible to dip the glass wool into the electrolytic polishing solution and rub it over some area of the casting thereby electrolytically polishing a small area of the casting.—Ed.

CONVERSION DEALS

Sir:

Please send one copy of the "Special Report" published on p. 287 of the Sept. 11 issue dealing with the scrap and steel situation.

A. W. GUDAL
Representative
Steel, Foundry and Scrap Industries' Committee for Expediting Iron and Steel Scrap
Malvern, Pa.

ELECTRIC FURNACE BRAZING

Sir:

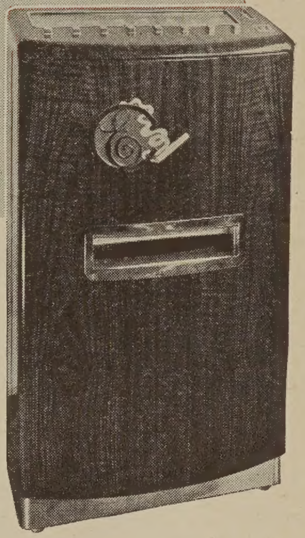
We have a copy of General Electric catalog, "Where and How to Use Electric Furnace Brazing," by H. M. Webber, noted as a reprint of THE IRON AGE. Inasmuch as we are in the brazing field, and are supplying many local manufacturers with brazed assemblies, and eagerly trying to keep our customers informed and up-to-date, we are very interested in this catalog. We would like to know if we could have 50 copies of it to distribute to our customers; also if we could make up our own cover with our firm's name on it. Please advise us of the above-mentioned possibilities.

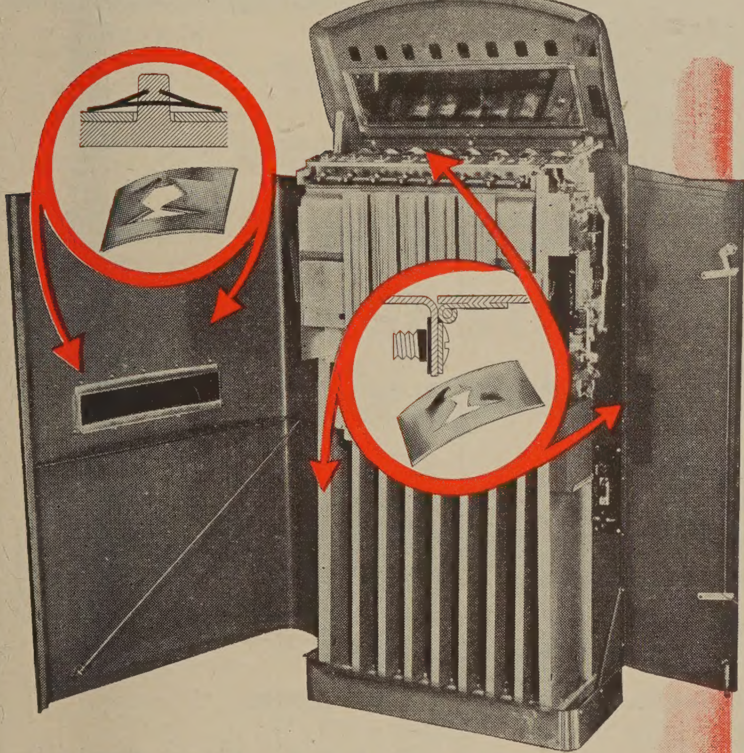
R. E. MARISAY
Sales Engineer
Atlas Brazing Co.
Toledo, Ohio

● The booklet reproducing a series of articles which appeared in THE IRON AGE in 1938-39, was produced and distributed by General Electric Company. We do not have

Assembly Costs Slashed 25%

64 SPEED NUTS on each "Electro" Cigarette Vending Machine *Boost* Production and *Reduce* Assembly Costs.





Push-on type SPEED NUTS are used over die cast studs as shown at left, to attach medallion and delivery compartment bezel, and for other fastening jobs not visible in photo. C7000 flat type SPEED NUTS are used to attach hinges to top cover, bottom frame and doors.

Mr. M. Caruso, President of C-Eight Laboratories, Newark, New Jersey, has this to say about SPEED NUTS:

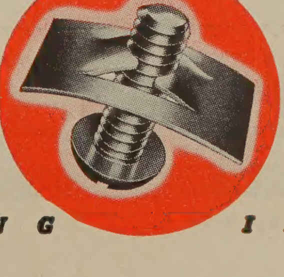
"Further experiments increased the use of SPEED NUTS in assembling our "Electro" All-Electrical Cigarette Vending Machine. Since this change over, a study of our costs reveals a *saving up to 25%*. We feel sure that more and more Tinnerman fasteners will be used on our equipment and will set a standard of quality and perfection for the ultimate user."

We're sure we can help you produce a better product at lower cost. Write us about your assembly problem today.

TINNERMAN PRODUCTS, INC. • 2040 Fulton Road, Cleveland 13, Ohio

In Canada: Wallace Barnes Co., Ltd., Hamilton, Ontario
In England: Simmonds Aeracessories, Ltd., London

In France: Aerocessoires Simmonds, S.A., Paris
In Australia: Simmonds Aerocessories, Pty. Ltd., Melbourne

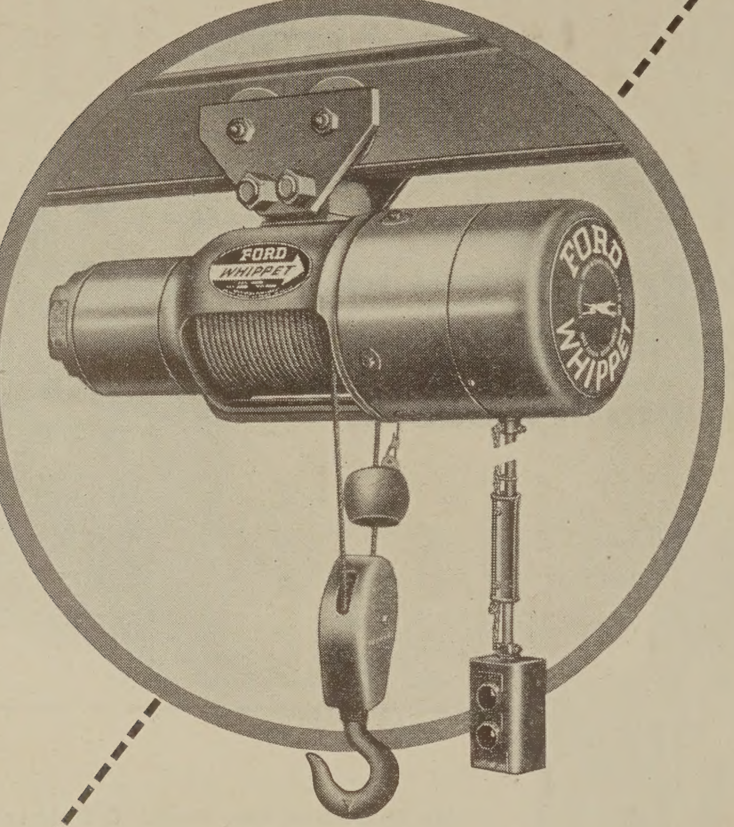


Speed Nuts* PATENTED

*Trade Mark Reg. U. S. Pat. Off.

MORE THAN 4000 SHAPES AND SIZES

FASTEST THING IN FASTENINGS



HERE'S YOUR Short Cut
FOR MATERIALS HANDLING----

......the FORD
WHIPPET
ELECTRIC HOIST

Your greatest problem today is to make deliveries faster at lower cost. That is exactly why Ford designed the new *WHIPPET* Electric Hoist. The *WHIPPET* is a cost reducer in production and in maintenance. There is no finer electric hoist in its price range on the market today. From 250 to 2000 pounds capacity. Send for your copy of folder DH-1325.

ACCO
York, Pa., Chicago, Denver, Los Angeles, Philadelphia, Portland, San Francisco, Bridgeport, Conn.
FORD CHAIN BLOCK DIVISION
AMERICAN CHAIN & CABLE
A·C·C
TRADE MARK
In Business for Your Safety

any copies on hand here. Possibly you could secure them from General Electric. If not, we would be glad to cooperate if you care to reproduce these articles.—Ed.

BATH VOLTAGE

Sir:

Will you please send one copy of the article, "Plating Bath Voltage," by G. W. Croninger and J. B. Mohler, found in the Oct. 30 issue.

B. PRINCE
Chief Chemist
Canadian Celanese Ltd.
Drummondville, Canada

READABLE DATA

Sir:

We wish to compliment you on the very excellent article on openhearth checkers which was published in the Nov. 13 issue. Walter B. Bryant, the author, has done an excellent job of presenting these data in a readable manner and his paper will be read with interest by anyone charged with the responsibility of designing or operating an openhearth furnace. . . .

R. W. KNAUFT
Sales Manager
Chas. Taylor Sons Co.
Cincinnati

BIRDSBORO PIG IRON

Sir:

. . . I notice with particular interest that the prices for the basing point of Birdsboro pig iron do not appear in any subsequent issue to that of Nov. 6, 1947. Would you be kind enough to offer some explanation for this omission and at the same time advise the current Birdsboro pig iron prices?

A. PRESTEGAARD
Royal Norwegian Purchasing Agency
New York

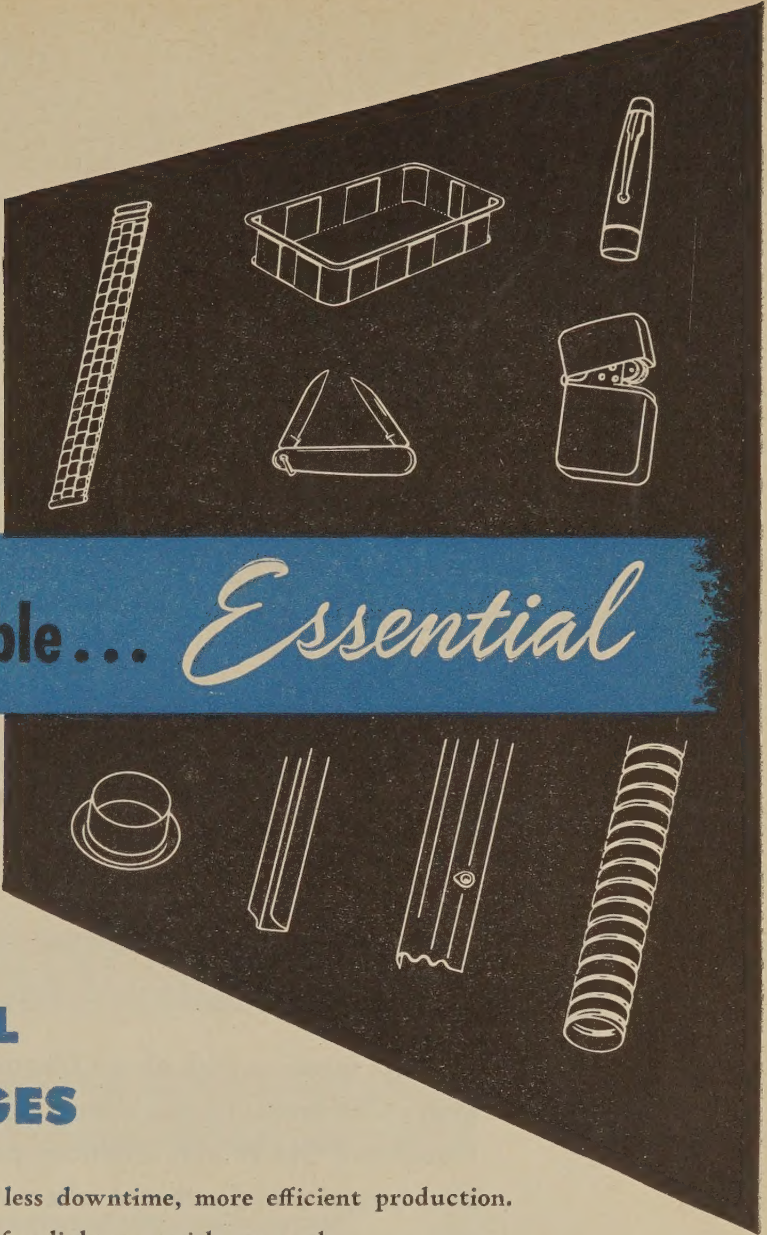
● **Under a recently adopted marketing arrangement, most Birdsboro iron has been removed from the open market. Therefore the price is no longer quoted in THE IRON AGE. See the issues of Nov. 6, p. 129 and Nov. 13, p. 123 for detailed description of the development.—Ed.**

DEEP WELDING

Sir:

We have read with considerable interest the article headed "Deep Fillet Gas Welding" published in the Jan. 23 issue. We regret to inform you, however, that the article contains some erroneous statements. In the introduction, the article is said to be a translation of an article published in "Autogene Metallbearbeitung" on Aug. 1, 1942. The correct title of the article was "AGA-Tiefschweissung-Eine neue Tasschweissmethode mit erheblich herabgesetzten Schweisskosten." It appeared over the signature of "Dipl. Ing. A. R. Gunnert (Svenska Aktiebolaget Gasaccumulator, Stockholm-Lidingo)," from which is seen that the writer of the article, who is at the same time the inventor of the method, is a Swede in the em-

Fabricators unfamiliar with CMP Stainless Strip Steel advantages may well find in them the solution to the present problem of increasing product quality, production efficiency and profit.



more than desirable... *Essential*

THESE CMP STAINLESS STRIP STEEL ADVANTAGES

- Extra long coils — for less downtime, more efficient production.
- Gauges thin as .001″—for lightness with strength.
- Unvarying coil-after-coil dimensional accuracy, physical properties and chemistry.
- Corrosion resistant and heat resistant properties inherent in various grades.
- Wide range of physicals and analyses—tailored for your job.
- Superior surface finish cuts finishing costs.
- Eye-appeal that gives your product greater sellability.
- Quick mill shipment to keep your production lines running. For detailed information, write, wire or call CMP.

CMP STRIP STEEL THINSTEEL

PRECISION COLD ROLLED

GIVES MAXIMUM PRODUCTION PER TON

THE COLD METAL PRODUCTS CO.
YOUNGSTOWN 1, OHIO

Sales Offices
NEW YORK • CHICAGO • DETROIT • ST. LOUIS
BUFFALO • DAYTON • LOS ANGELES

Peace on Earth,
Good Will toward Men

As we pause to wish all our friends a Merry Christmas, we are disturbed by thoughts of Old World conditions, poverty, hunger and death, the aftermath of war.

In a country like America, we and our families and friends can enjoy the spirit of Christmas. We only hope its message of Peace on Earth, Good Will toward Men will mean something to all the world.

And it will!

Stearns MAGNETIC MFG. CO.
MILWAUKEE 4, WISCONSIN

MAGNETIC
SEPARATORS
PULLEYS
CLUTCHES
BRAKES
MAGNETS

ploy of our company. The statement made in THE IRON AGE that the method was developed in Germany is thus not correct. It is true that the method was probably successfully employed in Germany after it had become known there through the said article, but that, of course, is quite another thing.

The method is protected by patents in most countries, among others, in England and U. S. A., and the correct name of it is "AGA Deep Welding." The name stated in THE IRON AGE was "Deep Fillet Gas Welding." This is incorrect as to facts, as the method is not intended for use in fillet welding but in butt welding. The characteristics of the method cannot be utilized to advantage to the same extent in fillet welding as in butt welding. It could adequately be called "AGA Deep Gas Welding" . . .

R. GUNNERT
Designs Dept.

Svenska Aktiebolaget
Gasaccumulator
Stockholm, Sweden

METAL DISTRIBUTION

Sir:

We would appreciate tear sheets of the article in the July 17 issue entitled, "Metal Distribution From Plating Bath," by J. B. Mohler and H. J. Sedusky.

G. N. DONOVAN

Western Electric Co.
Kearny, N. J.

TOOL STEEL GRADES

Sir:

Please send me a copy of the chart of "Comparable Tool Steel Grades" which was published in the Feb. 1, 1945, issue.

J. PAUL

Crown Can Co.
Philadelphia

- **The chart is available to readers at 15¢ a copy.—Ed.**

NEW PRODUCT DESIGN

Sir:

We are interested in obtaining a copy of "So You're Designing a New Product!" which appeared in the Oct. 31, 1946, issue.

B. A. BECKER

State of Minnesota
Dept. of Business Research
and Development
St. Paul, Minn.

PRESSURE CASTING

Sir:

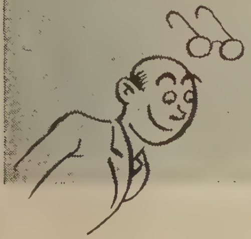
We have received an inquiry from a customer in Chile for a machine which will melt by pressure such elements as aluminum and bronze, and we wondered if you could recommend a machine which could be used in their shop for cast purposes. We understand this machine to be an automatic machine which melts by pressure the above-named materials; it is driven by a 10-hp electric motor with rear end

Q

Why did "live" manufacturers invest over $1,500,000 in the past 12 months for Sciaky *Three-Phase* welders?

A

Because *Three-Phase* is the answer to these long-standing resistance welding problems:

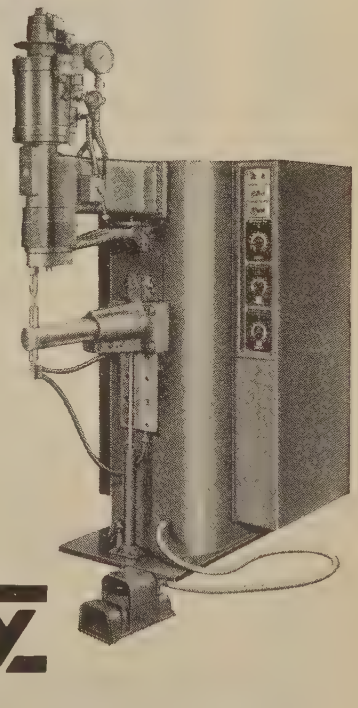


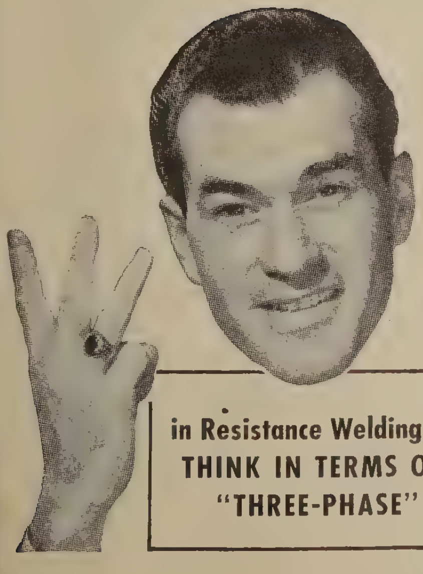
WELDERS USE 75% LESS LINE CURRENT

ON A BALANCED THREE PHASE LOAD

AT NEAR UNITY POWER FACTOR

Further advantages offered by this revolutionary achievement in electronics are: elimination of "flicker" on the line, high versatility—machines can weld aluminum, magnesium, brass, etc., high efficiency is not affected by variation in throat depth or masses of steel introduced into the throat. *Get the details on Three-Phase. Write for Bulletins 136 and 137-A.*





in Resistance Welding—
THINK IN TERMS OF
"THREE-PHASE"

SCIAKY

SCIAKY BROS., Inc.
4913 W. 67th St., Chicago 38, Ill.

THOMAS *flexible* COUPLINGS are specified by engineers wherever 100% dependability is demanded

THOMAS *flexible* COUPLINGS provide for Angular and Parallel Misalignment as well as Free End Float . . . *and Eliminate* BACKLASH, FRICTION, WEAR and CROSS-PULL

NO LUBRICATION IS REQUIRED!

The Thomas All-Metal Coupling does not depend on springs, gears, rubber or grids to drive. All power is transmitted by direct pull.

WRITE FOR COMPLETE ENGINEERING CATALOG

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

injector and heating and melting equipment for aluminum and bronze. Apparently, the models are quite small as they have a capacity of only ¾, 1 or 2 kg. . . .

J. S. FLYNN
President
Houghton & Richards, Inc.
Boston

● Melting by pressure is not familiar to us, but since the inquiry came from abroad where diecasting is known as pressure casting, undoubtedly a small diecasting machine is the unit referred to. We are forwarding names of companies making such equipment.—Ed.

PLEASE NOTICE

Sir:

We notice on p. 116 of the Oct. 2 issue, you show an aluminum casting for making tire molds. This casting was not produced by the U. S. Gypsum Co. at Yellow Springs but by Morris Bean & Co., Yellow Springs using U. S. Gypsum metal casting plaster. Our interest in this matter is due to the fact that we control the patents of the so-called Antioch Process of producing castings by the use of plaster under the formula of the Antioch Process and we would like to get the record straight as far as possible on the production of castings by this method.

C. M. JESSUP
Manager of Foundries
Allison-Bedford Foundry
Bedford, Ind.

● Thank you for calling our attention to this error. Blunders which mislead our readers are always regrettable.—Ed.

BARIUM BASE GREASE

Sir:

We would like to receive a copy of a paper presented before a recent annual AISE convention at Pittsburgh as reported in the Oct. 30 issue, p. 63. This paper was delivered by C. J. Boner, Chief Research Chemist of the Battenfield Grease & Oil Corp., and pertained to barium base lubricating grease. Any information that you can forward us on this paper together with the location of the Battenfield Corp. would be appreciated.

FRANK W. VOGT
Eastern Sales Mgr.
Ryertex Div.
Joseph T. Ryerson & Son, Inc.
Jersey City, N. J.

● The paper can be obtained from the Assn. of Iron & Steel Engineers, 1010 Empire Bldg., Pittsburgh, Pa., or by writing C. J. Boner, Chief Research Chemist, Battenfield Grease & Oil Corp., 32nd & Roanoke Rd., Kansas City, Mo.—Ed.

TINPLATE

Sir:

Would you please supply us with the names of all the steel manufacturers who manufacture tinplate. We use a considerable amount of this product and we need a new source of supply.

D. B. LEWIS
Lewis Food Co.
Los Angeles

The IRON AGE

THOMAS L. KANE
Publisher

○ ○ ○

R. M. GIBBS
Business Manager

○ ○ ○

B. H. HAYES
Production Manager

C. E. ELLIS
Promotion Manager

O. L. JOHNSON
Manager Market Research

○ ○ ○

CHARLES T. POST
Manager Circulation and Reader Service

○ ○ ○

Executive Offices
Chestnut and 56th Sts.
Philadelphia 39, Pa., U.S.A.
Editorial and Advertising Offices
100 E. 42nd St., New York 17, N.Y., U.S.A.

○ ○ ○

Regional Business Managers

FRED BANNISTER
W. Hartford 7, Conn.
62 La Salle Road

ROBERT F. BLAIR
Cleveland 14
1016 Guardian Bldg.

C. H. OBER
H. E. LEONARD
New York 17
100 East 42nd St.

PEIRCE LEWIS
Detroit 2
103 Pallister Ave.

B. L. HERMAN
Philadelphia 39
Chilton Bldg.

STANLEY J. SMITH
Chicago 3
1134 Otis Bldg.

JOHN M. HUGGETT
Pittsburgh 22
814 Park Bldg.

R. RAYMOND KAY
Los Angeles 28
2420 Cheremoya Ave.

○ ○ ○

Owned and Published by
CHILTON COMPANY
(Incorporated)

OFFICERS AND DIRECTORS
JOS. S. HILDRETH, *President*
EVERIT B. TERHUNE Vice-President
P. M. FAHRENDORF Vice-President
JULIAN CHASE Vice-President
THOMAS L. KANE Vice-President
G. C. BUZBY Vice-President
CHARLES J. HEALE Vice-President
WILLIAM H. VALLAR, Treasurer
JOHN BLAIR MOFFETT, Secretary
HARRY V. DUFFY T. W. LIPPERT
FRED V. COLE

○ ○ ○

GEORGE MAISWINKLE, Asst. Treas.

○ ○ ○

Chilton Editorial Board
PAUL WOOTON
Washington Representative

○ ○ ○

Member, Audit Bureau of Circulation

Member, Associated Business Papers

○ ○ ○

Indexed in the Industrial Arts Index. Published every Thursday. Subscription Price United States, its Territories and Canada $8; other Western Hemisphere Countries $15; Foreign Countries $20 per year. Single Copy, 35¢. Annual Review Number, $2.00.

○ ○ ○

Cable Address, "Ironage" N. Y.

○ ○ ○

Copyright, 1947, by Chilton Company (Inc.)

Vol. 160, No. 26 December 25, 1947

Editorial

Trouble in Paradise 59

○ ○ ○

Technical Articles

New Developments in Babbitting Methods 62
Oxygen in the Openhearth Bath 69
Electrolytic Iron Powder Production 70
Technique in Casting a 250-Ton Ingot 72
Reheating of 24S and 75S Aluminum Sheet 73
Electric Hand Trucks Increase Freight Carloads 79
Selecting Alloy Structural Steels 80
Japanese Magnetic Materials 84
New Equipment 85

○ ○ ○

Features

Fatigue Cracks 46
Dear Editor 48
Newsfront 61
Assembly Line 90
Washington 94
West Coast 98
Personals and Obituaries 102
European Letter 106
Industrial News Summary 108
News of Industry 111
Gallup Polls 119

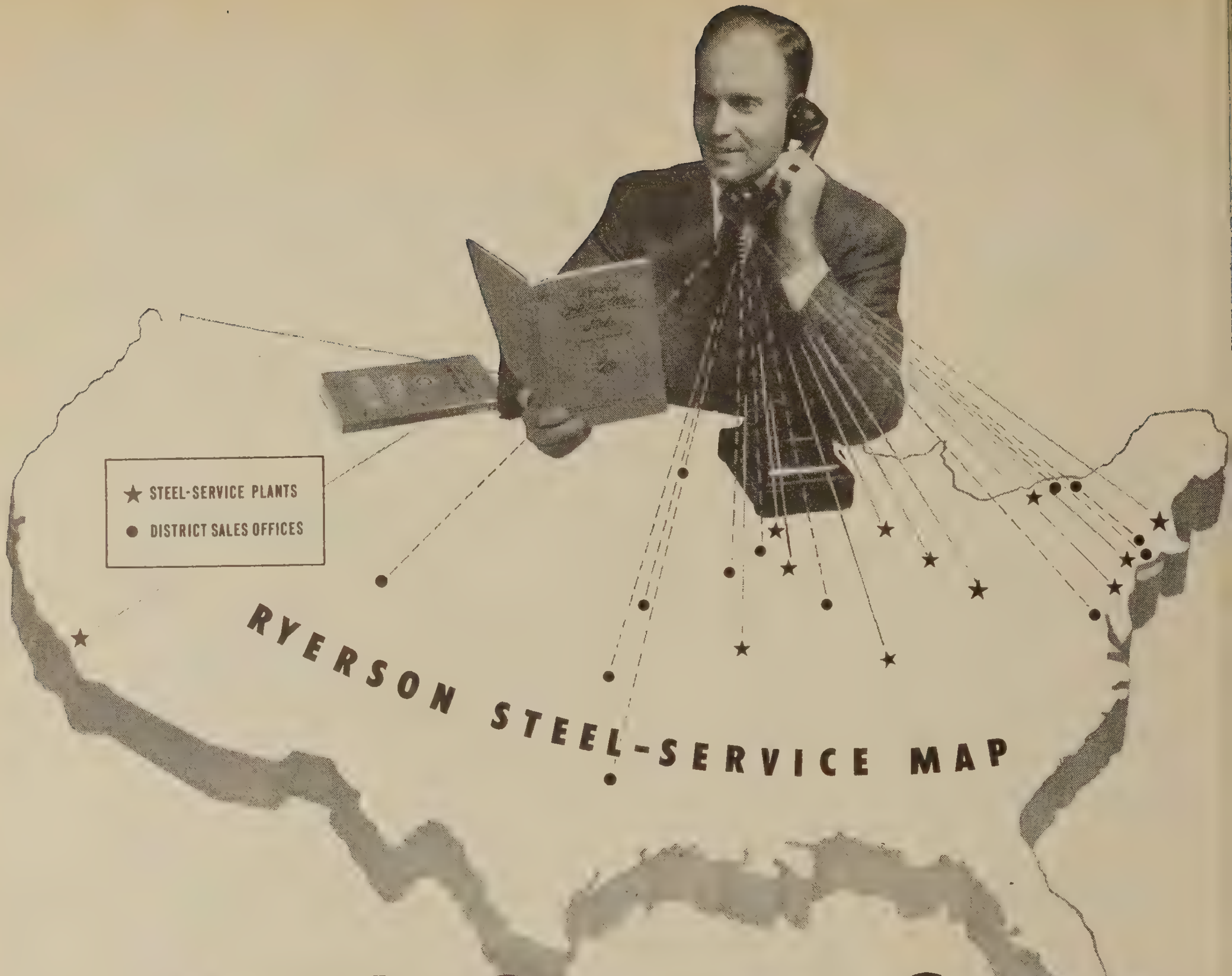
○ ○ ○

News and Markets

50 Years Ago 116
Industrial Briefs 118
New Construction 120
Machine Tool Developments 128
Nonferrous Market News and Prices 130-31
Iron and Steel Scrap News and Prices 133-34
Comparison of Prices by Week and Year 135
Finished and Semifinished Steel Prices 136
Alloy Steel Prices 137
Warehouse Steel and Pig Iron Prices 139
Ferroalloy Prices 140

○ ○ ○

Index to Advertisers 163-164



Here's Coast-to-Coast Service on Alloys

When you contact a Ryerson Plant for alloy steel, you're actually contacting all twelve plants in the Ryerson Steel-Service system. That means when the alloy you need is temporarily out of stock at the point of purchase, the huge stocks of eleven other Ryerson Plants are promptly checked to find the steel that meets your requirements. And it means that vast and varied Ryerson alloy stocks are within easy reach, no matter where you are in America.

In addition, the Ryerson system of alloy service enables you to purchase alloys the safe way—by *hardenability*. You can buy on the basis of desired performance requirements, thus minimizing the possibility of failure in finished parts and products.

To make heat treating easier, Ryerson also furnishes a complete alloy report that enables you to obtain accurate results without experimenting or costly re-treating. The report includes: Chemical analysis, results of hardenability test, physical properties as interpreted from test results, and recommended working temperatures for every heat in the shipment.

This complete alloy service is always available from all twelve Ryerson plants. Write, wire or call the nearest plant when you need steel.

Joseph T. Ryerson & Son, Inc. Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles

PRINCIPAL PRODUCTS

- Bars—
  - hot and cold rolled
  - reinforcing
- Structurals
- Plates—
  - Inland 4-Way Floor Plate
- Mechanical Tubing
- Boiler Tubes and Fittings
- Allegheny Stainless—
  - sheets, plates, shapes, bars, tubing, etc.
- Sheets and Strip Steel
- Tool Steel
- Wire, Chain
- Bolts, Rivets
- Babbitt
- Metal Working Tools & Machinery, etc.

RYERSON STEEL

The IRON AGE

100 E. 42nd ST., NEW YORK 17, N. Y.

ESTABLISHED 1855

o o o

December 25, 1947

o o o

THOMAS L. KANE
Publisher

o o o

T. W. LIPPERT
Directing Editor

Editorial Staff

News, Markets Editor. T. C. CAMPBELL
Technical Editor........W. A. PHAIR
Metallurgical Editor...E. S. KOPECKI
Machinery Editor ....T. E. LLOYD
Art Editor ....F. J. WINTERS
Associate Editor.........J. R. HIGHT
Associate Editor...H. W. VAN CAMP
Associate Editor.....E. L. SCHIMKO
Editorial Ass't. .....A. D. STOUT, JR.

o o o

Contrib. Editor.....J. S. LAWRENCE

Foreign Editors

England (Contrib.)....F. H. HARLEY
49 Wellington St., Strand, London,
W. C. 2, England
Canada (Contrib.)...F. SANDERSON
330 Bay St., Toronto, Canada
Paris (Contrib.)......PIERRE BENOIT
59 Rue Manin, Paris XIX, France

Regional News and Technical Editors

G. F. SULLIVAN
Pittsburgh 22
814 Park Bldg.

D. I. BROWN
Chicago 3
1134 Otis Bldg.

JOHN ANTHONY
Philadelphia 39
Chilton Bldg.

EUGENE J. HARDY
KARL RANNELLS
GEORGE H. BAKER
Washington 4
National Press Bldg.

W. A. LLOYD
Cleveland 14
1016 Guardian Bldg.

W. G. PATTON
Detroit 2
103 Pallister Ave.

OSGOOD MURDOCK
ROBERT T. REINHARDT
San Francisco 3
1355 Market St.

R. RAYMOND KAY
Los Angeles 28
2420 Cheremoya Ave.

Editorial Correspondents

ROBERT McINTOSH
Cincinnati

L. C. DEAN
Buffalo

G. FRAZAR
Boston

HUGH SHARP
Milwaukee

JOHN C. McCUNE
Birmingham

ROY EDMONDS
St. Louis

JAMES DOUGLAS
Seattle

Trouble in Paradise

ALL the advance posters of Marxian Utopia featured certain unqualified and enduring virtues of the perfect society. Full personal freedom, a rich cultural life, ample leisure, abundant food. No hunger, no crime, no exploitation, no inequality of incomes, no depression and no inflation or deflation—because in the society at the end of the Communist rainbow there would be no money. Financial crises were the peculiar stigmata of capitalism.

In interviews with two distinguished visitors from the other side of the iron curtain, Joe Stalin made inquiry regarding the imminence of a postwar crisis. That great idol of Communism, Karl Marx, had described and forecast the inevitable financial depression of capitalism, with possibly more feeling than accuracy. "When?" asked Joe of Eric Johnston and Harold Stassen, visitors who presumably should know the answer. In the meantime the Communists have done what they could to assure and accelerate the prophecy.

A providential and ironic justice has decreed that Russia itself should suffer the first real postwar crisis. Evidence seeping through tight Soviet frontiers had already suggested the event. It must come as a shock to many of the faithful that the Communist paradise should first reveal in acute form ailments which had always been described as exclusively peculiar to the unenlightened democracies of the West.

The devaluation of the ruble carries a story which no propaganda can obscure, no pink apologist disguise. In spite of the absolute, total power which a monolithic despotism possessed, there nevertheless was inflation—officially admitted and carrying some prices 12 to 15 times higher than prewar. The full resources of a powerful police state could not keep prices stable in the face of inadequate production and redundant currency.

It is clear that markets had been exploited by speculators, that substantial private accumulations had taken place, that ruble millionaires had actually developed in the arid soil of the Russian economy. It is further clear that the domestic depreciation of the ruble and related phenomena had created an emergency of such proportions as to require action which no true believer had ever thought necessary or possible in the Soviet State.

There is an obvious lesson for those who believe that price problems can be solved by the grant of greater authority to the government. Here is a state with the ultimate of possible power which now must openly confess failure. The only effective answer to the chronic problem of price and market values is greater production and a severe restraint upon the issue of currency. In a capitalist economy free enterprise, the right to make money and the privilege of spending, saving or bequeathing it constitute a time-tested stimulus to output which has only failed when the state interfered. It is a tragic comment on this interference that it is always conceived in the desire to promote a more abundant life.

On the other side, no finance minister with the power to manage the currency has ever been able to match the integrity which the gold standard imparted to money. Prices have fluctuated under the gold standard but never has a government with a currency honestly related to gold and freely convertible been forced to confiscate 90% of the cash assets of its citizens in order to avoid a financial catastrophe.

Joseph Stagg Lawrence

Eleven years ago, Horace Blackwell came to Inland from an Indiana farm. Seven years later he had moved up from laborer, through pit man, mold inspector, and expediter, to pit foreman of No. 1 Open Hearth—in charge of a crew of thirty.

Blackwell is only one of many young men at Inland . . . intelligent and ambitious . . . who are forging careers for themselves in the Inland mills . . . helping to turn out quality steels to your exacting specifications. INLAND STEEL CO., 38 S. Dearborn St., Chicago 3, Ill. Offices: Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

Country Boy Makes Good ...at Inland

INLAND STEEL

BARS • STRUCTURALS • PLATES • SHEETS • STRIP • TIN PLATE
FLOOR PLATE • PILING • REINFORCING BARS • RAILS • TRACK ACCESSORIES

Introducing INLAND'S "MEN OF STEEL"

IRON AGE — NEWSFRONT

Dec. 23, 1947

► The Milwaukee Chamber of Commerce is actively campaigning to bring new industries to that city, while industries already there complain of a labor shortage. The Milwaukee Railroad has been unable to hire enough men to man their car building shops, although they have plenty of steel to do the job.

The gray iron foundries in Milwaukee have been short of help for months, and Allis Chalmers is conducting a recruiting drive to get enough labor for a third shift, but it has been unsuccessful to date.

► This is a great season for lubricants in automotive die shops. With metal finishing costs high, every effort is being made to eliminate rough surfaces in dies, but drawing lubricants are much in demand as the major auto producers prepare to go into production on new models.

► Probability of a "third round" wage demand by the CIO steelworkers' union is again worrying fabricators, most of whom have contracts with the steelworkers. However, their fears--expressed at about this time last year--that Big Steel would set an inflexible contract pattern did not come true. Many of them got contracts based on their local conditions. There is no reason to believe that the pattern will be different this year.

► Orders totaling more than $26 million have been placed in this country on a single integrated steel mill-hot strip production unit for England. This is only a part of the dollars that have already been authorized by the British government for the project.

► Note on the freight car shortage: Steel companies know about it. Youngstown Sheet & Tube Co. has had to ship bright wire in refrigerator cars and track spikes in stock cars.

► Use of light metals will figure importantly in development of fork-lift trucks and other materials handling equipment for military uses. Developers will aim at the fewest possible models requiring the least number of spare parts.

► Hudson engineers have given considerable attention to streamlining the new model. Because of reduced drag, acceleration and economy particularly at high speeds have been greatly improved. From comparative tests, from speeds over 60 mph the new model coasts 15 to 20 pct farther than the earlier design.

► After a year of research some of the larger alloy steel users have decided that a modified 4100 series with lower chromium content is the answer to many of their problems. They hope to order the grades in sufficient tonnages to get AISI to recognize their new chemistries as standard steels, and waive the $2 a ton non-standard steel extra.

► Government suasion will be used to channel the large tonnages of enameling sheets necessary for the construction of prefab houses at the plant recently sold by the government to Lustron at Columbus, Ohio.

► Synthetic yarn is now being woven into fabrics for automobiles as a substitute for cotton and leather. The new materials are said to be spot proof, washable, and are reported to give double the life of wool.

Currently expensive, these new materials are being used to replace imitation and real leather in station wagons and convertibles. Besides, their introduction at this time might serve to squelch the lush $40-$75 seat cover racket indulged in by dealers of closed cars.

► Contracts for the biggest jet engine ever made, three times the size of the largest existing unit, will soon be placed by the government with a midwest manufacturer.

► The Administration has been trying to use tin conservation as the reason for a sharp slash in so-called non-essential uses for tinplate. Some sources believe that if tin conservation is required, making export tinplate 1.25 lb of tin per base box of tinplate instead of 1.50 lb as is now the practice would be of more substantial aid.

► The united front among economists has been broken for the first time in years. One can find as many who will predict a recession as there are those who will not. The pro-recessionist is catering to fear, while the anti is playing upon wishes.

New Developments in

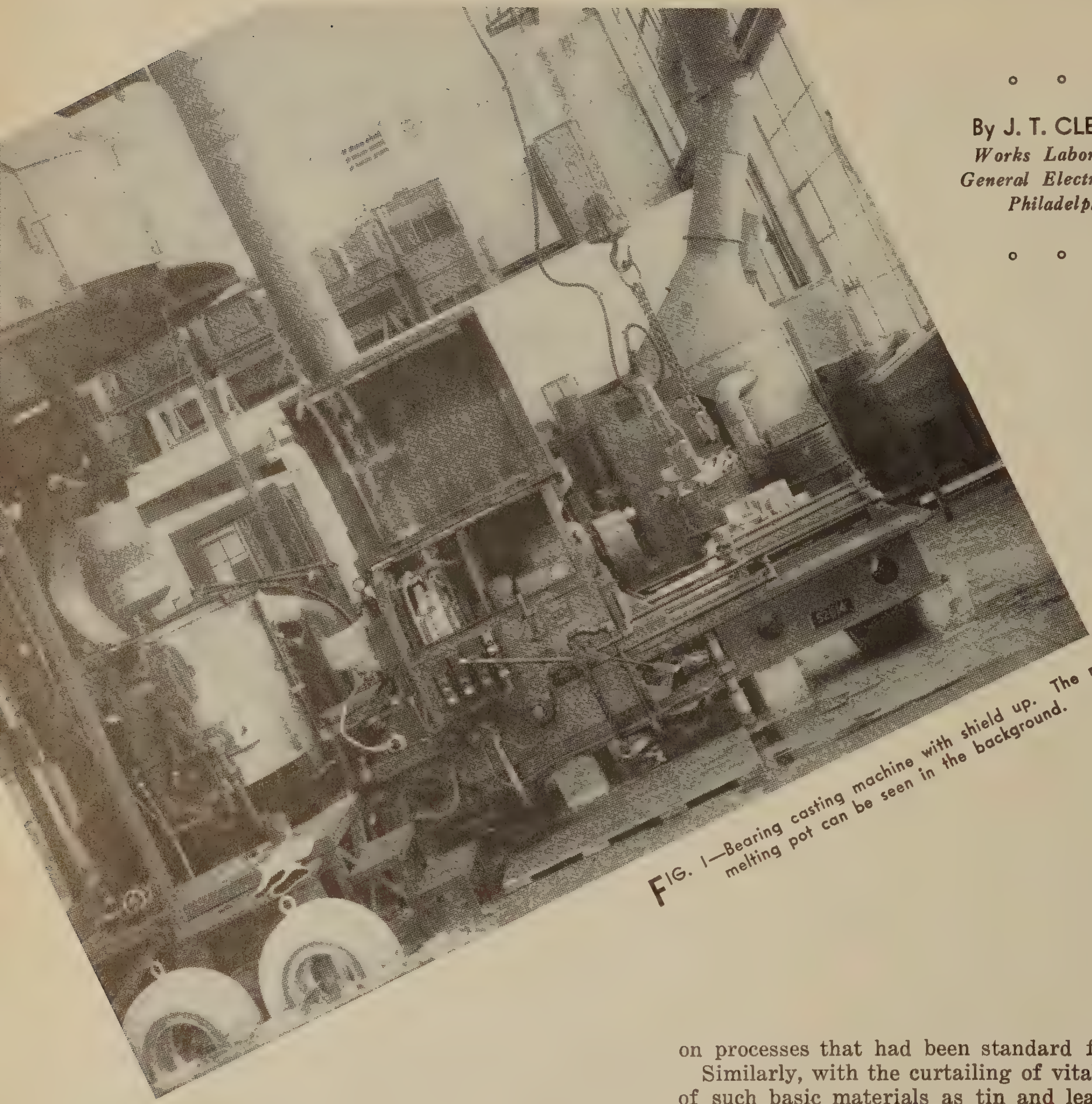


FIG. 1—Bearing casting machine with shield up. The remelting pot can be seen in the background.

By J. T. CLENNY
Works Laboratory,
General Electric Co.,
Philadelphia

BABBITTING production and design methods were among the mechanical and metallurgical techniques most widely affected by the war. The necessity for greatly increased production, the curtailing of vital materials, and all of the important secondary problems they introduced did much to help produce the most widespread changes the field had known for years.

Doubling of production was not unusual; in many cases it was quadrupled or sextupled. This not only called for speedup of basic primary processes but such important secondary ones as cleaning and pickling methods. Primary increases would have been of little value if the supplementary quantities had been bottlenecked at other stages. For that reason it was vital to improve on processes that had been standard for years.

Similarly, with the curtailing of vital supplies of such basic materials as tin and lead, metallurgical changes were important to make the best use of those materials available. Centrifugal casting proved the best method of increasing the basic production of these vital units.

The use of centrifugal casting is not a new process in making bearings at GE; those for small motors have been made by this method since the turn of the century. However, the adaption of this process to large bearings of 4-in. OD and more became necessary when the wartime ship programs pointed to the immediate need for hundreds of bearings ranging from 4 to 30 in. OD.

With such a demand for these bearings, there was an urgent need for a machine to produce them. Designers took the available laboratory data on pouring temperatures of babbitts, controlled solidification by water cooling, and speeds of rotation for optimum metallurgical results and

Babbitting Methods

The shortage of supplies of tin and lead, added to a tremendous surge in production rates and higher service requirements, spurred many new and significant developments in babbitting techniques during the war. This article describes many of these new methods, with particular emphasis placed on the cleaning and pickling operations and on the metallurgical considerations involved.

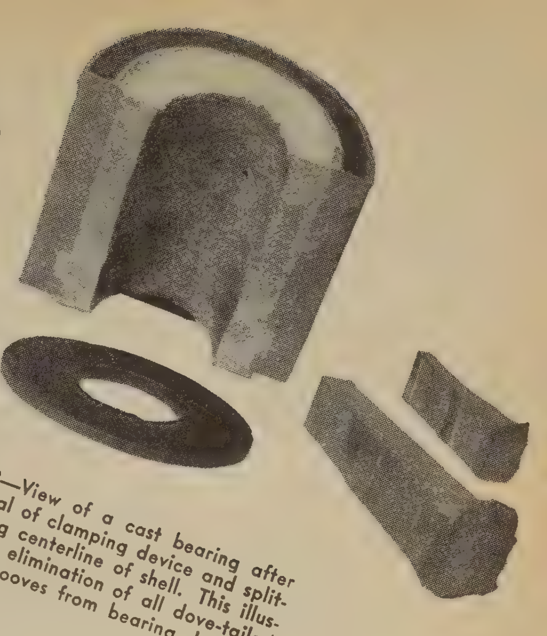


FIG. 2—View of a cast bearing after removal of clamping device and splitting along centerline of shell. This illustrates the elimination of all dove-tailed anchor grooves from bearing designs.

built three machines. See fig. 1. One handled large volume, small size bearings up to 9 in.; the second, intermediate sizes of 9 to 16 in. OD; and the third, bearings up to 32 in. OD. This arrangement proved advantageous, because the medium machine could be adapted to handle sizes larger or smaller than the normal range, whenever the other machines needed repair.

One of the first babbitting problems that arose was in connection with dove-tailed anchor grooves (see fig. 2), both lateral and circumferential, and ball-seated type bearings. These combinations gave structures of different cooling rates which in turn promoted thermal stresses in solidification, segregation, and growth of the hardening constituents, the antimony-tin cubes and the copper-tin needles, when using an alloy of 83.34 pct Sn, 8.33 pct Sb, and 8.33 pct Cu. All of these were decidedly bad for the centrifugal casting process and required changes in design.

Until the centrifugal casting machines were available it was a constant problem to develop a continuous bond between the steel and babbitt in manufacture and a material free from porosity. This accounted for the need of mechanical anchorage.

However, before it was possible to eliminate mechanical anchorage as a source of trouble, it was necessary to improve the methods of preparing the metal, machining and cleaning, before the pretinning operation in order to obtain a uniform, purely chemical-metallurgical bond.

Cleaning and Pickling Methods

Previously, the general finish acceptable on the machined shell was approximately equivalent to an F6½, or micro-inch readings of 500 average, with limits of peak-to-valley of 1750. This would be equivalent to a rough boring mill job.

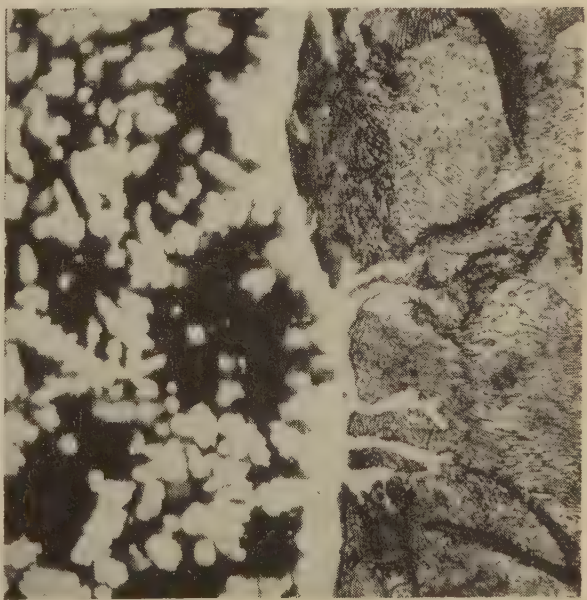
These bearings were degreased in a trisodium phosphate bath and rinsed in clean water. The steel was then pickled in muriatic acid which was followed by a water rinse and a zinc chloride flux dip. From the flux, the linings were immersed in a pot of molten tin at 535 to 570°F for at least a half hour. From the tin pot, the bearing halves were assembled in the still casting fixtures and the babbitt poured at temperatures between 895° and 930°F.

This process was adequate for prewar production schedules and requirements, but was far beneath the standards for the modern bearing.

Experiments were first begun on the pickling of steel. Straight acid mixes were tried, then combinations of acids, followed by tests applying electric current as in a plating bath. Finally, the use of alternating current at moderately low voltage and high amperage was investigated.

The results of the latter looked so good that a production installation was made. Later when first reports were heard of the molten caustic

FIG. 3—Babbitt to cast iron bond resulting from use of a caustic bath. The white copper-tin constituent is shown to be present along the bond and to penetrate the cast iron at the points where the graphite has been removed. The cast iron shell is the section on the right. Etchant: 2 pct Nital—$FeCl_3$; 500X.



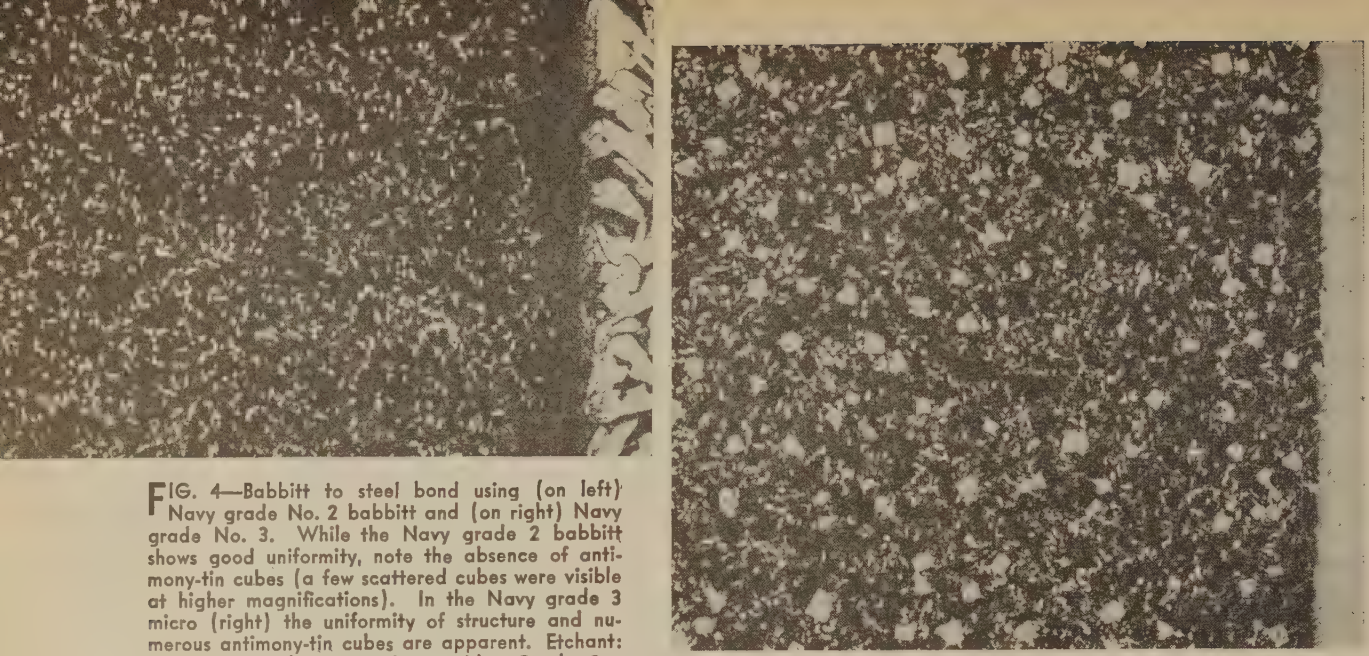


FIG. 4—Babbitt to steel bond using (on left) Navy grade No. 2 babbitt and (on right) Navy grade No. 3. While the Navy grade 2 babbitt shows good uniformity, note the absence of antimony-tin cubes (a few scattered cubes were visible at higher magnifications). In the Navy grade 3 micro (right) the uniformity of structure and numerous antimony-tin cubes are apparent. Etchant: micro of Grade 2—acetic-peroxide; Grade 3—$FeCl_3$; both 100X.

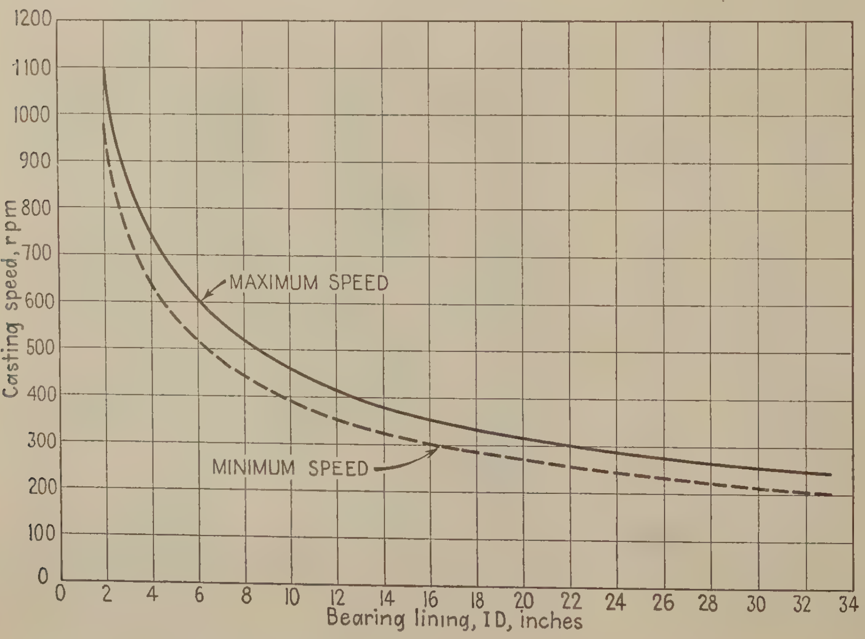
process, a new series of tests were made. After considerable debate on the comparative merits of the two processes, electrolytic v. molten caustic (bath A), it was agreed to build a production installation with the electrolytic process. These babbitting rooms proved to be an excellent laboratory for the next 3 years. It established the proper handling procedures from rough shell to finished babbitted liner, made comparative tests of the various methods involved, determined the feasibility of proposed changes in the processes, machines, and other equipment.

But it was established not long after the alternating current pickling process was operating that the results obtained in a small 1-ft diam crock were impossible to duplicate in a large 48x48-in. tank. One of the main reasons for this was the lack of sufficient power. Calculation of the test data showed an installation of about 7000 to 8000 amp or approximately 200 amp per sq ft of surface area was needed, and at best only slightly over one tenth of that amount could be obtained from the equipment. The decision to return to the old acid pickling method was reached, replacing the F6½ finish with a grit blasted bearing liner surface. This method was very successful.

The molten caustic, in the meanwhile, was doing a creditable job; the first batch of salts remaining usable for 9 months of top quantity production.

Several other batches, however, did not fare as well, putting the laboratory in a very receptive mood for another type electrolytic molten caustic, bath B. In laboratory tests, this was superior to the preceding type (bath A) on steel but could not match it and a third type solution (bath C) on cast iron (see fig. 3). In additional tests, it was agreed to try high current densities in a straight molten caustic soda. Here results on a par with those of bath B were obtained. Since there was a considerable price differential, the straight electrolytic molten caustic was put into production in preference to bath B.

FIG. 5—Speed chart for centrifugally casting babbitt. Formulas for computing these speeds are given in the text.



The use of relatively high current densities required a change in the handling of liners. While the necessary changes were being made, a modified electrolytic molten caustic — bath A — process was used in production. The results on tests and production bearings during this period were good indicating troubles experienced with previous batches of molten salt might have been the fault of machining practices. This was borne out in laboratory tests where ground surfaces and clean cut F4 finishes gave better results than F6½ rough, F6½ grooved, and F4 torn finishes. However, to produce these desirable surfaces, an increase in machining costs would be necessary. This was another reason for changing to the electrolytic molten caustic process, since the lining surface finish was not as critical as in the molten caustic, bath A, process.

The electrolytic molten caustic process has been in operation now for more than 2 years with no serious troubles experienced in the operation of the method.

Metallurgical Considerations

From the very start of the war, it was evident that imported tin supplies would be drastically curtailed. Thus the first step was to consider alloy substitutions. Of these, there were four, along with the GE alloy, and another of a somewhat similar alloyage. The nominal composition of the babbitts tested is given in table I.

Small motor bearings, approximately 2 in. ID were used in these experiments, centrifugally

TABLE I

Nominal Composition (pct) of Babbitts Tested

Alloy Type	Lead	Tin	Antimony	Arsenic	Cadmium	Nickel	Copper
1. Type A**	......	83.34	8.33	......	......	......	8.33
2. Type B*	......	89.0	7.5	......	......	......	3.5
3. Type C	Bal	5.0	15.0	......	......	......	......
4. Type D	Bal	1.0	15.0	1.0	......	......	0.5
5. Type E	Bal	0.75	12.5	3.0	......	......	0.5
6. Type F	......	......	......	......	Bal	1.5	......

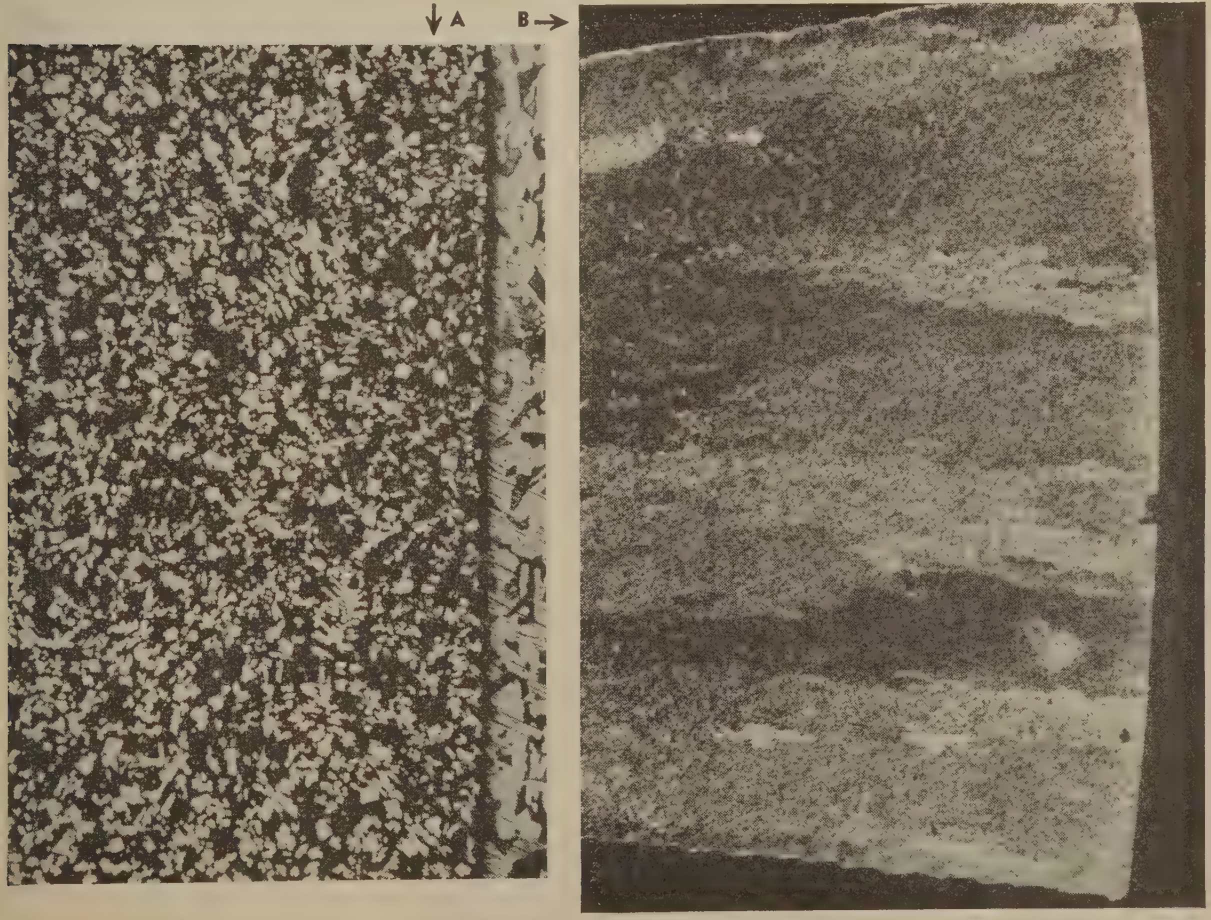
* Navy 46M2 Class 2.
** Navy 46M2 Class 3.

Physical Properties of Babbitts Tested

Alloy Type	Ultimate Strength, Psi		Yield Point, Psi		Brinell 20°C	Hardness 100°C
	20°C	100°C	20°C	100°C		
1. Type A*	17,600	9,900	6,600	3,150	27.0	14.5
2. Type B*	14,900	8,700	6,100	3,000	24.5	12.0
3. Type C*	15,600	6,150	3,400	1,750	20.0	9.5
4. Type D***	9,800 (25°C)	6,700	......	......	22.0#	9.3 (302°F)
5. Type E***	10,350 (25°C)	6,400	......	......	20.0#	6.4 (302°F)
6. Type F**	16,400 (28°C)	10,500	11,700 (28°C)	......	33.0 (28°C)	22.0

# As cast.
* Data from ASTM Handbook (1944).
** Data from ASM Handbook (1939).
*** Data from American Smelting & Ref. Co. booklet, "Babbitts G & S."

FIG. 6—Structures resulting when proper casting speeds are used. Micro *A* (left) (100X—FeCl$_3$ etchant) covers a lining cast at 500 rpm; note uniformity of copper tin and antimony-tin cube distribution throughout the tin matrix Macro *B* (right) (10X; ammonium polysulphide etchant) shows very fast cooling denoted by the long perpendicular tin crystals building up on the steel surface. The steel plate is on the right.



cast at 800 to 1000 rpm and water-cooled. As the test program began, it became increasingly evident that the cadmium and nickel situations were reaching the same critical state as the tin. The nickel-cadmium alloy was therefore dropped from the roster. The type C alloy (see table I) had been used for a period of years prior to the war and was found to be a rather indifferent performer. However, its modification with 1 pct As made a vast improvement. It was decided to concentrate on that compound when the results with the 3 pct As-Pb alloy did not show any outstanding advantage over type B.

A centrifugal process was worked out for the lead alloy and was used in all motor bearings. It was never used in any marine installations of the turbine and gear sets because the lead alloy is subject to excessive corrosion when the lubricating oil exceeds an acid neutralization number of one, as determined by titration with standard sodium hydroxide solution.

Tests made on turbine-gear bearings using Navy Grade 2 and 3 babbitts were used to determine the relative merits of these two alloys. In the photomicrographs, fig. 4, it is seen that both materials are uniform, but that the Navy Grade 2 does not have any antimony-tin cubes. This is because the antimony content has been held within the limits for its retention in solid solution.

The Navy Grade 3 alloy shows some moderately small cubes, uniformly distributed throughout the matrix. When in this condition, it will develop as good or better properties than the Grade 2 in all respects. This art has been established by many tests on tensile specimens, and has even been exhibited in the work done on the fatigue of babbitts. However, the differential between these two materials is not great in any case.

The first problem in the establishment of a centrifugal casting procedure for babbitt was to establish a chart for determining the speed of rotation necessary to develop a centrifugal force uniformly in liners varying in diameters from 1 to 32 in. This was done by taking the general equation for centrifugal force:

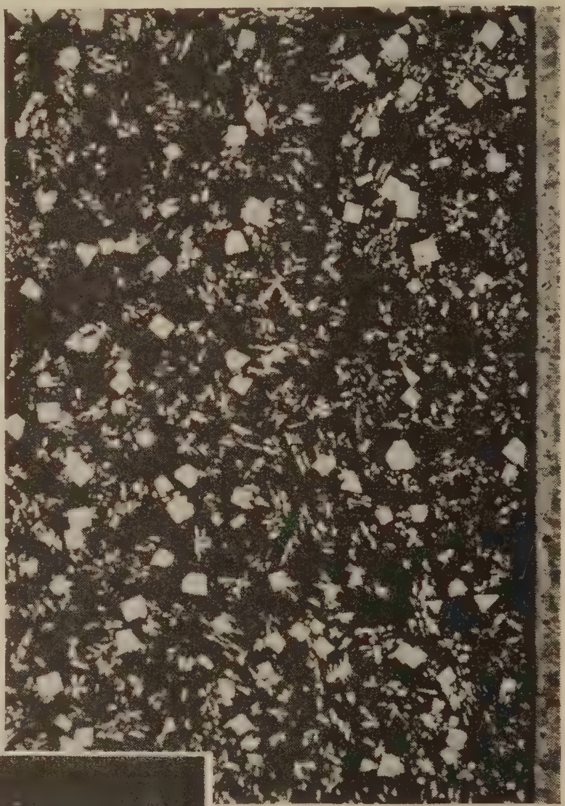
$$C.F. = \frac{W}{g}(w^2r)$$

WHERE:

C.F. is centrifugal force
W is the mass of the object in question
g is the acceleration of gravity
r is the radius of gyration
w is the angular velocity
N is rpm
d is the diameter of gyration
D is the inside diameter of shell
d_1 is the diameter of shell less thickness to center of gravity of the babbitt. Babbitt cast ½ in. thick.

$$d_1 = D - \frac{1}{2}$$

This force was then made a constant to give



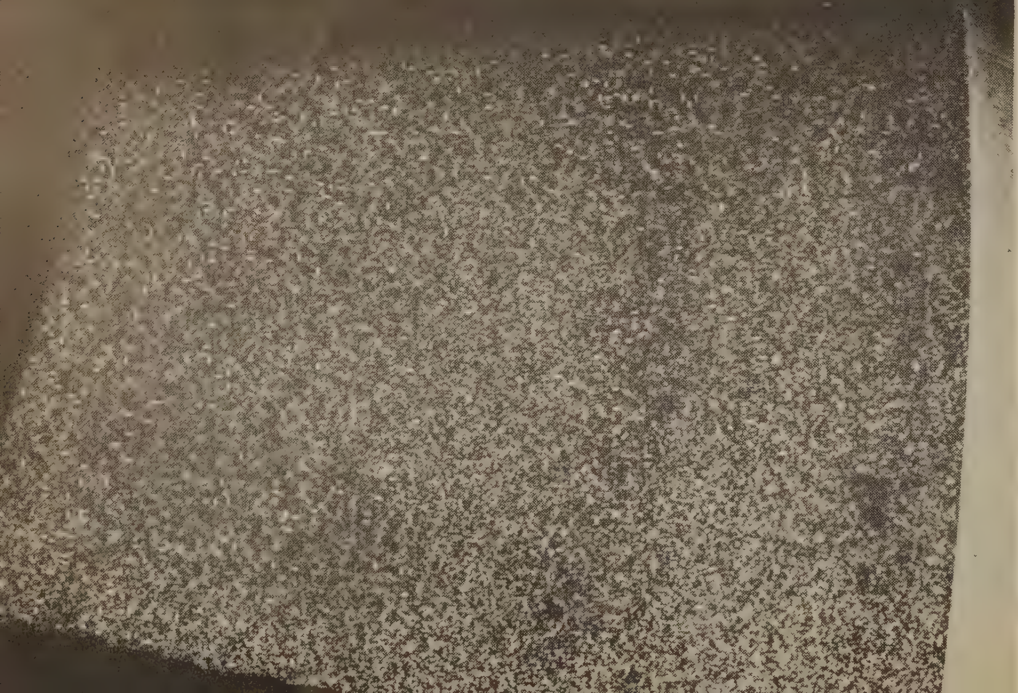
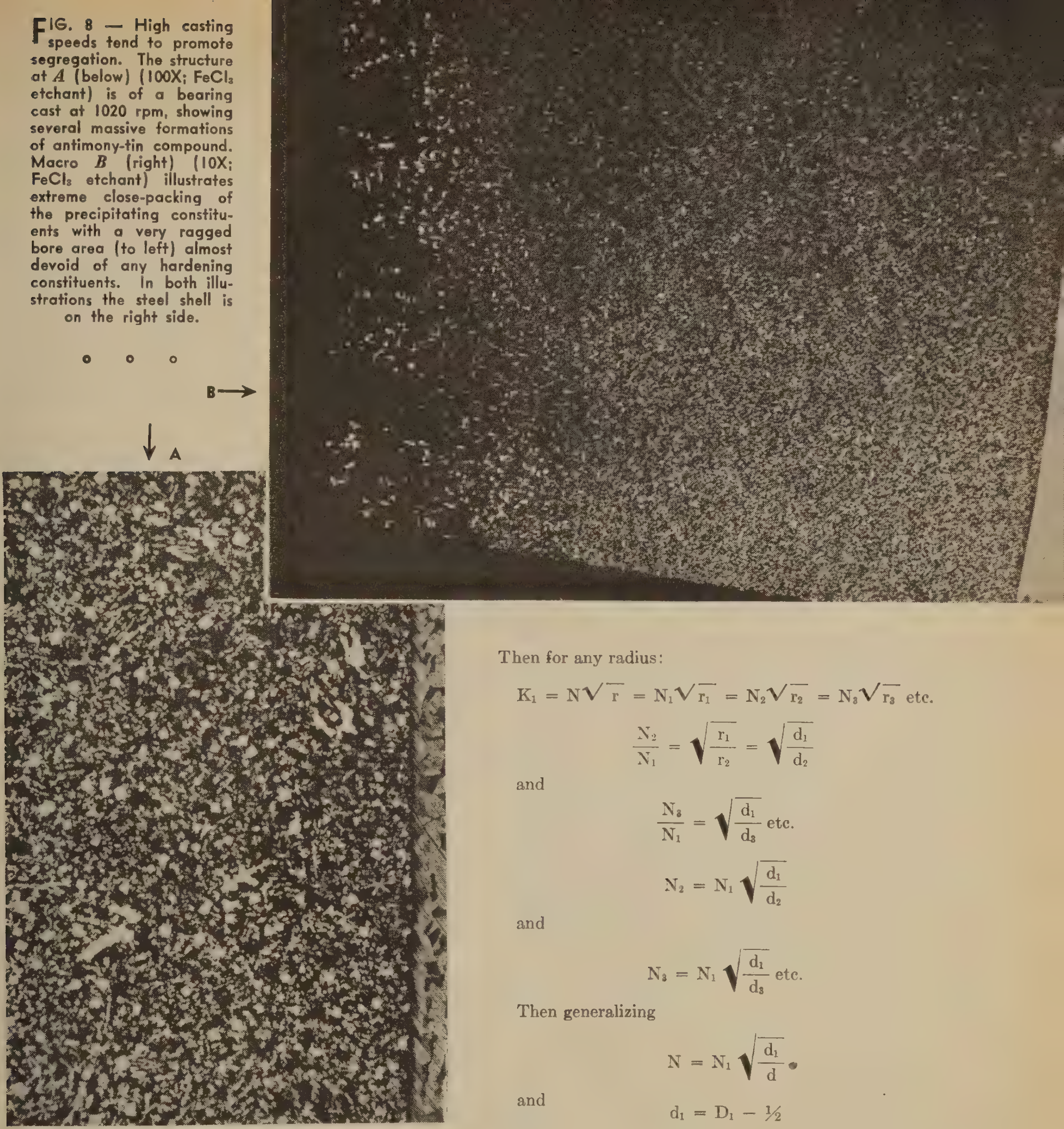


FIG. 7—Effect of too low casting speed. Micro *A* (above) (100X; $FeCl_3$ etchant) shows a structure resulting from a casting speed of 200 rpm. Note large areas devoid of hardening constituents and relatively large sizes of the cubes. Macro *B* (left) (10X; $FeCl_3$ etchant) is another example of too low speeds, resulting in holes in the material near the bond (right).

FIG. 8 — High casting speeds tend to promote segregation. The structure at *A* (below) (100X; $FeCl_3$ etchant) is of a bearing cast at 1020 rpm, showing several massive formations of antimony-tin compound. Macro *B* (right) (10X; $FeCl_3$ etchant) illustrates extreme close-packing of the precipitating constituents with a very ragged bore area (to left) almost devoid of any hardening constituents. In both illustrations the steel shell is on the right side.



a similar effect on all sizes of bearings, and thus derive an equation for determining the correct speeds for the various sizes, based upon results obtained on the standard test lining of 4.5 in. ID. The constant K, below, is the centrifugal force exerted on each bearing. It was made constant for this special case to insure uniformity in each bearing since this force varies directly with the radius of the bearing.

$$K = \frac{(C.F.)g}{W} = w^2 r \qquad w = \frac{2\pi N}{60}$$

$$K = \frac{4\pi^2 N^2 r}{3600}$$

$$N = 60\sqrt{\frac{K}{4\pi^2 r}} = \frac{K_1}{\sqrt{r}}$$

Then for any radius:

$$K_1 = N\sqrt{r} = N_1\sqrt{r_1} = N_2\sqrt{r_2} = N_3\sqrt{r_3} \text{ etc.}$$

$$\frac{N_2}{N_1} = \sqrt{\frac{r_1}{r_2}} = \sqrt{\frac{d_1}{d_2}}$$

and

$$\frac{N_3}{N_1} = \sqrt{\frac{d_1}{d_3}} \text{ etc.}$$

$$N_2 = N_1\sqrt{\frac{d_1}{d_2}}$$

and

$$N_3 = N_1\sqrt{\frac{d_1}{d_3}} \text{ etc.}$$

Then generalizing

$$N = N_1\sqrt{\frac{d_1}{d}}$$

and

$$d_1 = D_1 - \tfrac{1}{2}$$

then

$$N = N_1\sqrt{\frac{D_1 - \tfrac{1}{2}}{D - \tfrac{1}{2}}}$$

For a 4.5-in. diam shell between the limits of 600 to 700 rpm, little segregation was obtained. Thus, for other sizes:

$$N_{Min.} = 600\sqrt{\frac{4}{D - \tfrac{1}{2}}} \qquad N_{Max.} = 700\sqrt{\frac{4}{D - \tfrac{1}{2}}}$$

These two equations were used to calculate the speeds of rotation for all shells from 1 to 32 in. diam.

The speed chart shown in fig. 5 was the result. The general structure of a bearing cast at the proper speed is shown in fig. 6. When the speed is too low, porosity results, as shown in fig. 7.

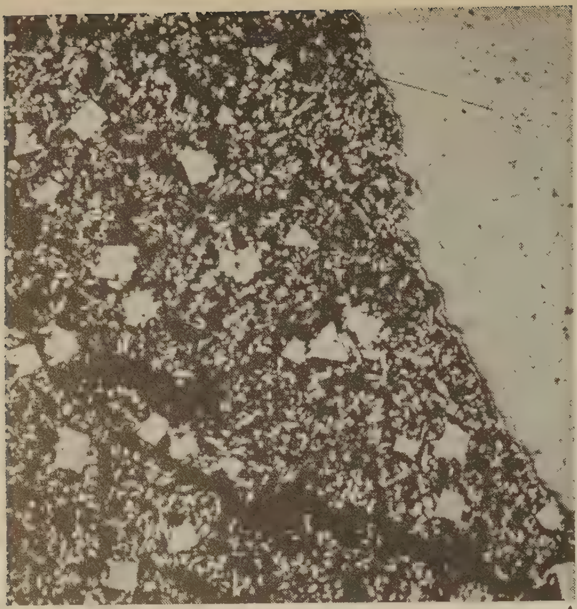


FIG. 9—Excessively high casting speeds cause rupture of the metal when it is in the plastic state, as illustrated here. This crack starts in the shim area and runs parallel to the bond. 100X; $FeCl_3$ etchant.

When the speed is too high, segregation takes place, as shown in fig. 8. Sometimes excessively high speeds cause rupture of the metal when it is in the plastic state, as shown in fig. 9. Tensile properties of the bearings used in these speed tests are indicated in table II.

The next step in reducing segregation was to insure a uniform cooling of the bearings during solidification. This had to be carefully controlled, because a bearing cooled directly to room temperature by the spray nozzles was more than likely to rupture at the bond. In fact, in early trials, bearings so cooled were heard to rupture with a distinct metallic snap. This can be easily explained by using the formula:

$$\frac{f}{E}(1 - \sigma) = (\alpha wm - \alpha s)(T_1 - T_2)$$

WHERE:

E is Young's Modulus—7,400,000 for babbitt.

σ is Poisson's Ratio—0.33

αwm is coefficient of expansion—for babbitt, 0.000024

α s is coefficient of expansion — for steel, 0.000012

T_1 is temp, at which babbitt is stress free—220°C

T_2 is final temp of lining after quenching

f is the stress applied by thermal effects

The above equation neglects the effects of the stress on the steel, assuming it to be practically rigid.

Substituting in the above equation, the final condensed form is:

$f = 132.6\ (220 - T_2)$

WHEN:	THEN:
T_2 is 300°F	f is 9,280 psi
T_2 is 212° F	f is 15,900 psi
T_2 is 120°F	f is 22,500 psi

The above results indicate the possibility of bond failure when a lining is cooled rapidly much below 300°F. If, however, the lining is allowed to cool slowly from above 300°F, the tin alloy has sufficient time to stress relieve itself, since its recrystallization temperature is somewhat below normal room temperature.

Some data on diecast B21A1 (type A, table I) test bars, given in table III, will illustrate the possibility of exceeding the tensile properties of this alloy.

Another of the many problems was the effect of impurities, particularly on bond strength. At the start of the investigation it was noted that lead-base alloys were widely used as the tinning agent by the trade. Tests were made to compare values using both tin and lead-base alloys for tinning the bearing shells. Two very dissimilar conclusions were reached. It was found that when water cooling was used, bearings tinned with pure tin gave better physical properties than those where lead base alloys had been used. Air cooling obtained exactly opposite results.

A possible answer to these seemingly inconsistent results is the fact that lead alloy acts as a dilutent, preventing an excess of copper-tin constituent from being deposited at the bond. The specific gravity of the lead would tend to retain this metal at the bond and thus hinder normal diffusion of the heavy copper-tin constituent already handicapped by the rapid quench.

It is known from many microexaminations of the bond areas in bearings that low tensile strength values are obtained from continuous or excessive copper-tin segregated at the bond. This latter would be promoted by air cooling. All the clues seem to be available, therefore, to deduce the answer: Use tin to bond, with a controlled water quench. The lead content must be carefully controlled, because lead and tin form a eutectic which has a relatively low melting point, 360°F, at operating temperatures of about 300°F the strength is badly affected and with localized overheating this eutectic will melt.

TABLE II

Tensile Strength of Bearings Used in Speed Tests (in psi)

Speed, Rpm	Bar No. 1	Bar No. 2	Bar No. 3	Bar No. 4	Average
200	4,445B	4,700B	......B	3,260B	4,135 psi
300	4,125B	3,925B	6,500B	1,830B	4,095 psi
400	3,075B	4,525B	3,850B	13,150BM	6,150 psi
500	9,055BM	10,920BM	8,120BM	4,600B	8,175 psi
600	......B	6,525B	12,350M	13,450M	10,775 psi
675	13,025M	8,150M	12,200M	6,825B	10,050 psi
818	6,500M	7,500M	11,250M	......B	8,410 psi
945	3,250B	7,420M	13,390M	1,825B	6,480 psi
1,020	6,975M	7,750M	......B	12,325M	9,010 psi

WHERE: B is failure at the bond, no fracturing in the metal.
BM is failure at the bond, some fracturing in the metal.
M is failure in the metal (babbitt).

TABLE III

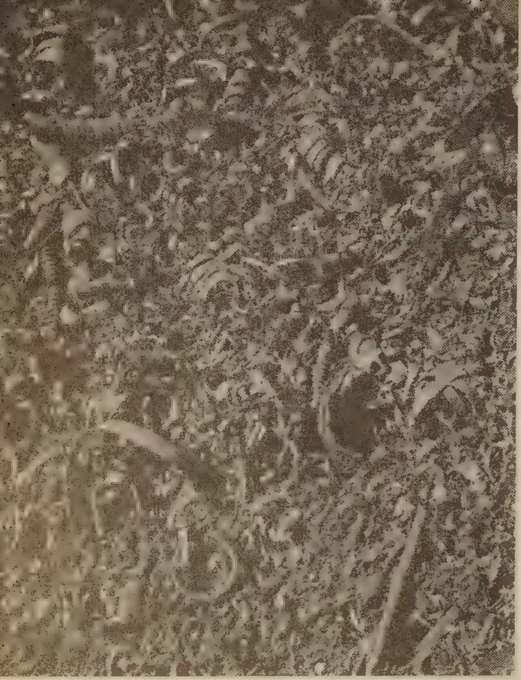
Physical Properties of Some Diecast Test Bars

Bar No.	Mold Temp	Tensile Strength, Psi	Elongation, Pct in 2 In.
1	Room	13,760	3.5
2	Room	13,370	1.5
3	Room W. Q.	13,470	1.5
4	Room W. Q.	12,100	1.0
5	85°C	11,630	1.0
6	85°C	13,410	2.0
7	100°C	14,060	4.5
8	100°C	13,430	4.5
9	120°C	13,750	5.0
10	120°C	14,910	5.0

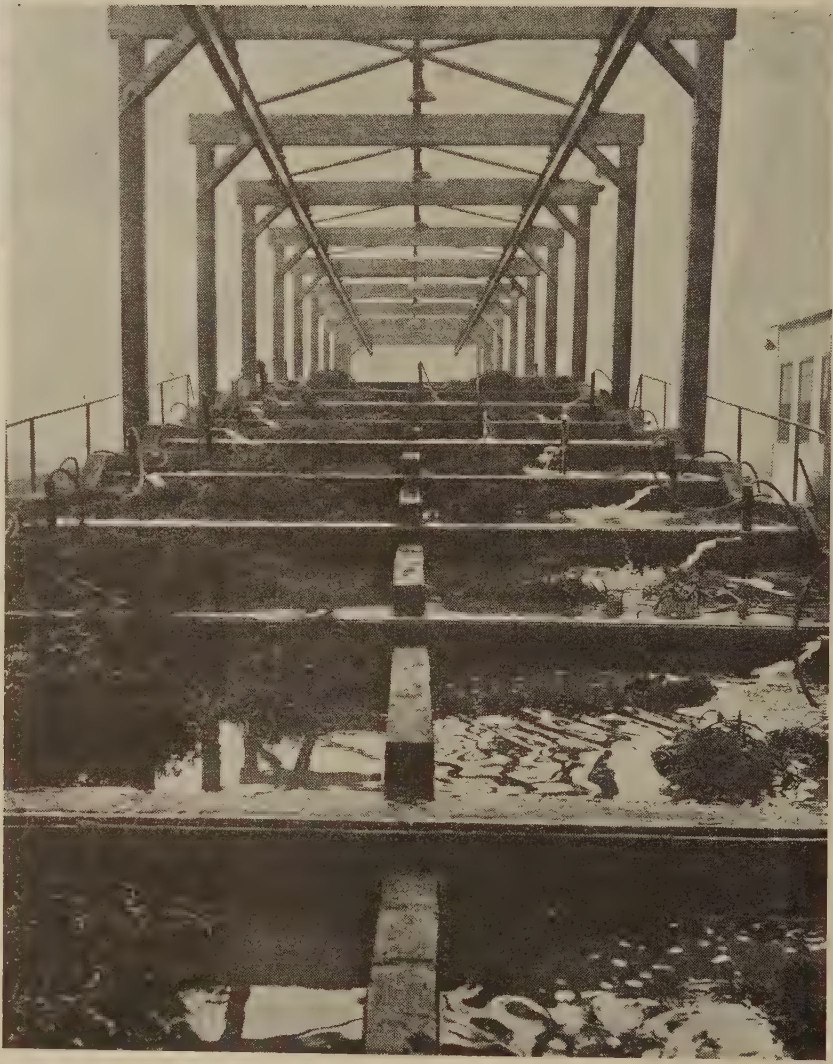
Oxygen in the Openhearth Bath

This comprehensive comparison of the effect of injection of (1) various purities of oxygen, (2) air, and (3) nitrogen, into the openhearth bath, was presented at the fall meeting of the Assn. of Iron & Steel Engineers, in a paper by J. H. Hornak, Carnegie-Illinois Steel Corp.

	100% OXYGEN HEATS			90% OXYGEN HEATS			70% OXYGEN HEATS	44% OXYGEN HEATS		20.8% OXYGEN HEATS (SYNTHETIC AIR)			20.8% OXYGEN HEATS (COMPRESSED AIR)			100% NITROGEN HEATS			LIME AND ORE	
RANGE OF CARBON AT START BLOW	1.01% to 1.40%	0.61% to 1.00%	0.25% to 0.60%	1.01% to 1.40%	0.61% to 1.00%	0.25% to 0.60%	0.61% to 1.00%	1.01% to 1.40%	0.61% to 1.00%	1.01% to 1.40%	0.61% to 1.00%	0.25% to 0.60%	1.01% to 1.40%	0.61% to 1.00%	0.25% to 0.60%	1.01% to 1.40%	0.61% to 1.00%	0.25% to 0.60%	0.60% to 1.00%	1.00% to 1.40%
Number of Heats	26	32	12	2	2	2	4	2	3	1	4	4	5	1	1	2	1	1	15	8
Nominal Tons per Heat	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225
Limestone Charged per Ton	132	127	126	142	142	142	116	128	117	142	100	110	115	128	128	112	112	112	127	142
Limestone Fed per Ton	3.6	1.7	1.1	8.9	.....	.....	.....	6.7	.....	.....	3.3	.....	2.7	.....	.....	.....	.....	.....	7.7	3.3
Ore Charged per Ton	289	233	257	240	253	207	209	202	202	213	272	252	150	238	142	202	173	202	209	176
Ore Fed per Ton	25.3	23.2	10.7	31.1	26.7	40.0	23.0	33.0	32.0	44.0	28.0	8.4	40.0	36.0	27.0	55.5	33.3	22.2	30.4	28.1
Carbon at Start Blow, Pct	1.21	0.82	0.46	1.16	0.77	0.41	0.86	1.27	0.87	1.22	0.87	0.46	1.15	0.79	0.55	1.14	0.72	0.45	0.77	1.19
Carbon at Finish Blow, Pct	0.08	0.09	0.08	0.10	0.24	0.05	0.09	0.13	0.08	0.08	0.12	0.07	0.09	0.13	0.07	0.18	0.14	0.11	0.10	0.20
Points of Carbon Removed During Blow	113	74	39	106	53	36	77	114	79	114	75	39	106	66	48	96	58	34	67	99
Time of Blow, Min	81	56	39	78	32	46	63	67	59	88	73	50	81	72	69	105	80	50	.....	.....
Points of Carbon Removed per Min	1.40	1.32	1.00	1.38	1.66	0.78	1.33	1.25	1.34	1.30	1.09	0.81	1.35	0.92	0.70	0.91	0.73	0.68	0.51	0.59
Pressure at Valve	70	70	70	70	70	70	70	70	70	70	70	70	63	30-65	63	70	70	70	.....	.....
Cu Ft Gaseous Material per Heat	81,300	56,200	40,800	72,000	24,000	39,000	51,800	88,000	55,000	78,000	71,000	45,000	73,000	56,000	60,000	86,500	50,000	28,000	.....	.....
Cu Ft Gaseous Material per Min	1,010	1,040	1,070	900	730	830	860	960	930	890	990	920	900	780	870	825	630	560	.....	.....
Cu Ft Gaseous Material per Pt. C	730	780	1,115	680	430	1,070	670	770	700	680	930	1,120	680	850	1,250	905	860	820	.....	.....
Cu Ft Gaseous Material per Ton	360	250	180	320	107	175	230	390	245	350	315	200	325	250	265	385	220	125	.....	.....
Cu Ft Gaseous Material per Pt. C x Tons	3.2	3.5	5.0	3.0	1.9	4.8	3.0	3.4	3.1	3.0	4.1	5.0	3.0	3.8	5.6	4.0	3.8	3.6	.....	.....
Cu Ft Oxygen per Heat	81,300	56,200	40,800	64,800	21,600	35,100	36,200	38,700	24,200	16,400	14,900	9,450	15,300	11,750	12,600	.....	.....	.....	.....	.....
Cu Ft Oxygen per Min	1,010	1,040	1,070	810	657	750	600	420	410	185	210	195	190	165	185	.....	.....	.....	.....	.....
Cu Ft Oxygen per Pt. C	730	780	1,115	610	387	960	470	340	310	145	195	235	140	180	265	.....	.....	.....	.....	.....
Cu Ft Oxygen per Ton	360	250	180	290	96	157	161	172	107	73	66	42	68	52	56	.....	.....	.....	.....	.....
Cu Ft Oxygen per Pt. C x Tons	3.2	3.5	5.0	2.7	1.7	4.3	2.1	1.5	1.4	0.6	0.9	1.1	0.6	0.8	1.2	.....	.....	.....	.....	.....
Nitrogen Content Steel Product, Pct	.004	.004	.004	.004	.004	.004	.005	.004	.004	.004	.004	.004	.004	.004	.004	.006	.....	.....	.004	.004



Electrolytic Iron



ABOVE

FIG. 1—Scrap steel borings and turnings go into leaching tanks in this form.

○ ○ ○

RIGHT

FIG. 2—Concrete leaching vats in which the ferric chloride is run over the scrap steel.

PRODUCTION of powdered iron in quantity and at a cost calculated to extend its uses in industry is being undertaken by Tacoma Powdered Metals Co., Inc., Tacoma, Wash. Experimental production is now going on and expectations of company officials are that by January 1948 the plant will be in full operation, with the daily output running into several tons.

In contrast to production practices in eastern plants where powdered iron is obtained by gas reduction, by use of soluble anodes in an electrolytic process, or by the carbonyl method, the Tacoma company employs an insoluble anode. This method demands a cheap and abundant source of electric power, available supplies of hydrogen and hydrochloric acid, and a ready source of scrap steel borings and turnings. All of these factors attendant in economic and quantity production are present in Tacoma, or the immediate vicinity.

At a production level of 10 tons of powdered iron per day, the Tacoma plant will need an available supply of borings and turnings amounting to approximately 8000 tons annually, for recovery of iron from scrap amounts, roughly, to 50 pct. Oxidation is one factor which governs the volumes recovered, as does efficiency of the electrolytic process itself.

Scrap is stockpiled in the open, see fig. 1, immediately adjacent to large, uncovered, inclined

Powder Production

By W. J. GRANBERG
Seattle

An electrolytic iron powder process, employing insoluble anodes and ferrous chloride as the electrolyte, is described in this article. Power and raw material requirements, and operating techniques associated with this method are outlined by the author, on the basis of an anticipated production rate of 10 tons per day.

concrete leaching tanks, fig. 2, and is lifted into them by a hoist-operated electromagnet. Ferric chloride is fed into the leaching tanks by gravity from large storage tanks nearby. Flowing over the scrap, which is rabbled in the tanks by a workman so that all of it is submerged, the ferric chloride becomes ferrous chloride. Drawn off at the foot of the tanks, the ferrous chloride is pumped into the plant, where it is run through a canvas filter to remove impurities picked up in the leaching tanks. A second leaching process removes any residue of ferric chloride and any excess hydrochloric acid. The solution, now purified, is either processed immediately or pumped to holding tanks outside the plant for use as desired.

The electrolytic process to recover the iron takes place in 40 rectangular cells which contain graphitized carbon anodes and cathodes of stainless steel sheets. The ferrous chloride enters the cells at their bottoms. The maintenance of high hydrogen overvoltage is necessary to secure the proper deposition of the iron on the steel sheet cathodes. The spent, or depleted electrolyte overflows the cells through weirs at their tops, thus assuring a constant operating level. With the introduction of a limited amount of hydrochloric acid, the solution is pumped back into the storage vats after spilling into an open concrete basin to permit cooling, see fig. 3.

Power to accomplish electrolysis is derived from the 13,000-v municipal transmission lines

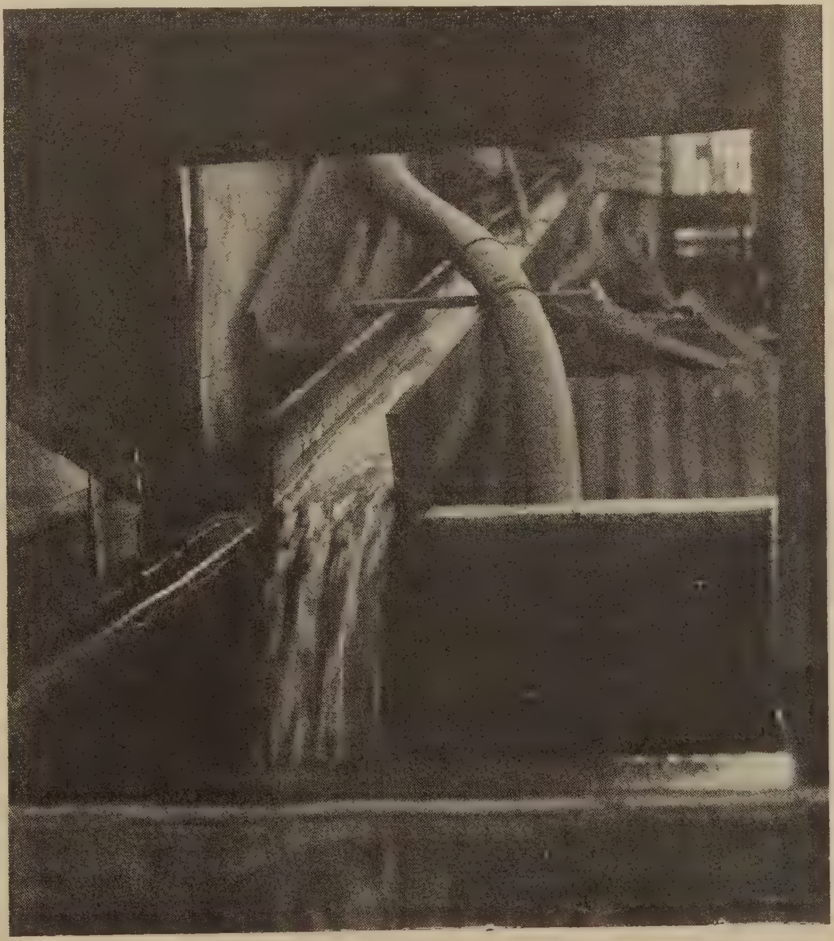


FIG. 3 — Depleted electrolyte from cells is run into concrete basin for cooling and then pumped back into storage vats, as shown here.

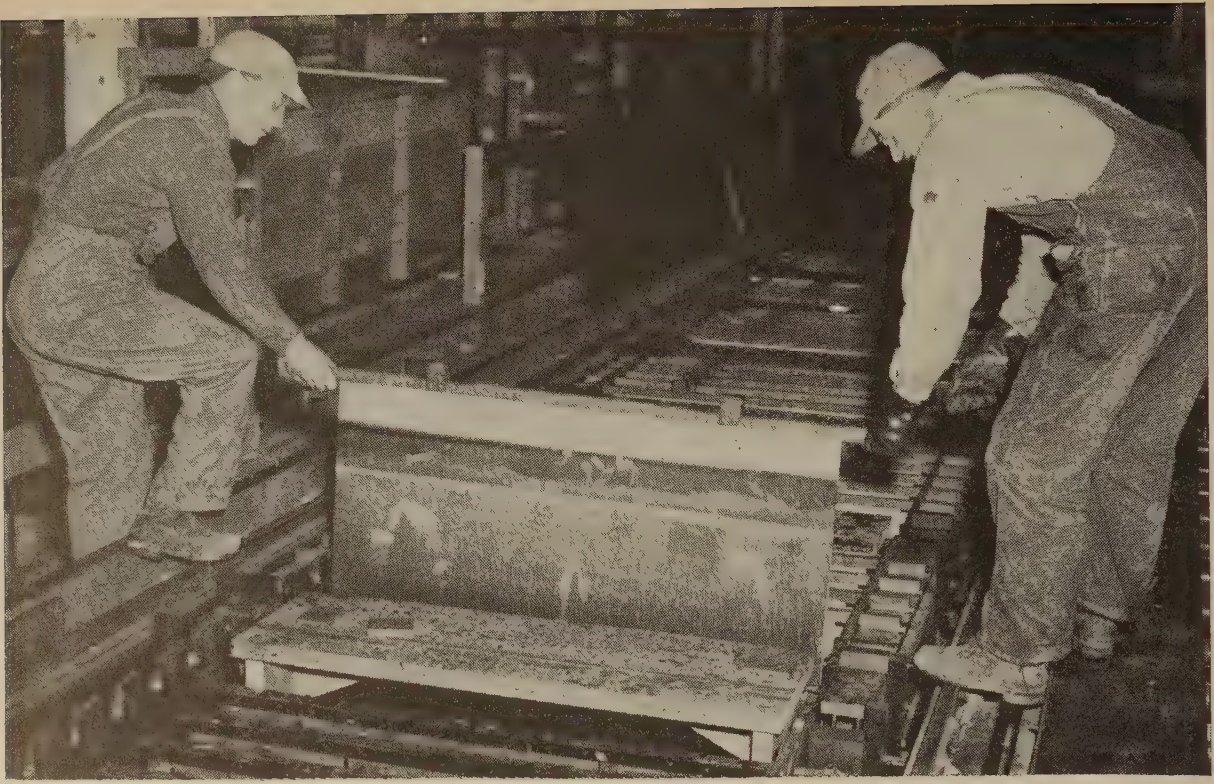


FIG. 4—Stainless steel sheet cathode is lifted from electrolytic cell for inspection. It carries iron in flake form.

and rectified within the plant to supply a direct current to the electrolytic cells at 365 v and 5000 amp. The current density employed depends upon the condition desired, and varies from 40 to 60 amp per sq ft.

It is the removal of the iron deposit from the cathodes which has been one of the prime problems in electrolytic production. A stripping device has been devised, which will supplant the slow and costly manual labor process heretofore employed. This automatic stripper lifts the plates from the cells, strips off the iron, buffs the plates, and returns them to the electrolyte. Success of the entire production process at an economically possible figure, and in quantity, might well be said to hinge on this improved stripping method.

Removed from the cathodes in the shape of flakes, see fig. 4, the iron is washed with water, dried, and fed to a ball mill that powders it to a 150 to 200-mesh screening. The combined oxygen is removed by treating the powder in a hydrogen reduction furnace, utilizing electric power. This completes the manufacturing process, and the finished product is packed and sealed in airtight containers to prevent oxidation.

Technique in Casting a 250-Ton Ingot

FRANCIS B. FOLEY, supt. of research, Midvale Co., Philadelphia, created an unexpected degree of interest with his presentation of a paper entitled "Large Ingots" at the recent fifth annual Electric Furnace Steel Conference, AIME. Midvale had the occasion, a short time ago, to cast a 108-in. octagon ingot weighing 545,700 lb, necessitating the combining of metal from three 100-ton openhearth heats, and Foley described the technique followed in performing this operation.

The body of the ingot, one of the largest ever made, weighed 448,800 lb, including a bottom pool of about 7500 lb of metal and the sinkhead of 96,900 lb, which is about 18 pct of the total weight. The author pointed out that it makes very little difference when considering a quantity of molten metal of this order whether the mold is filled through its bottom or by pouring through its top. Actually, this mold was filled 40 in. by first bottom pouring 140,000 lb through a runner to provide a pool to prevent splash when the mold from this point on was filled by pouring from a headbox through the top. The ladle nozzle was 3 in. and the headbox had a 2-in. nozzle. The ingot was poured in 3 hr total time.

The author acknowledged that while it is good practice in casting forging ingots to set the molds with the large end up to promote soundness by providing better cooling conditions, this particular mold was set small end up for mechanical reasons. These large molds are set up in pouring pits below floor level for pouring, and the difficulties that may arise from trying to pull the ingot out of a mold set large end up can be very serious. The practical approach therefore is to set the mold small end up and strip the mold off the ingot. A large ingot of this type will not be stripped until the second day after pouring. It then shows definite color and is charged hot for heating prior to press forging.

Reheating Of 24S and 75S Aluminum Sheet

By J. A. NOCK, JR.
Asst. Chief, Physical Metallurgy Div.,
Aluminum Research Laboratories,
Aluminum Co. of America,
New Kensington, Pa.

In view of the interest in elevated temperature characteristics of the high strength aluminum alloys, the Aluminum Co. of America has conducted an extensive study of the effect of reheating the 24S and 75S alloys. The author discusses the changes in strength and elongation values and in resistance to corrosion, occurring at various temperature levels, when reheating the two alloys in the naturally-aged and artificially-aged conditions. Limitations and possibilities of application at elevated temperatures of the 24S and 75S alloys are also indicated in this article.

CHARACTERISTICS of high strength heat-treatable aluminum alloy products after exposure to elevated temperatures are of prime interest to both design engineers and fabricators. The former are interested because the properties after prolonged exposure will influence the design or selection of material, while the latter are interested because the loss in properties will limit the use of reheating to obtain greatly improved formability. The effect of reheating upon the tensile properties and resistance to corrosion of both naturally and artificially-aged 24S sheet products has been studied over the temperature range of 212° to 500°F. Reheating surveys of 75S sheet products have been confined to a study of the tensile properties over the temperature range of 225° to 450°F because preliminary corrosion tests showed that reheating either did not affect or slightly improved the resistance to corrosion.

Reheating 24S and Alclad 24S Sheet

The reheating of naturally-aged 24S sheet products beyond the initial re-solution is in all respects equivalent to artificial aging. The initial re-solution effect, after very short reheating periods at temperatures as high as approximately 375°F, is a decrease in strengths accompanied by slight increases in elongation values.

These changes in strengths and elongation values are illustrated in fig. 1 for 24S-T3* sheet (24S-T flat sheet) and in fig. 2 for 24S-T36 sheet (24S-RT flat sheet) after various periods of reheating (artificial aging) over the temperature range 300° to 500°F. Data for these materials plus an additional sample of 24S sheet cold rolled to a reduction of 3.5 pct as compared to the 5.5 pct reduction of 24S-T36 sheet, (24S-RT flat sheet) are given in table I after reheating at temperatures of 250°, 275° and 300°F for rather extended periods.

Subsequent to the initial decreases in strengths mentioned above, the strengths increase to maximum values after a certain optimum period at each temperature. These maximum strengths are reached after the following periods of reheating, i.e., artificial aging at the several temperatures mentioned; 2 weeks at 275°F, 5 days at 300°F, 16 to 32 hr at 350°F, 4 to 12 hr at 375°F, 2 to 4 hr at 400°F, 1 to 2 hr at 425°, 0.25 to 0.50 hr at 450°, less than 0.25 hr at 500°F.

Reheating at the lower temperatures covered by the data in table I did not develop maximum strengths after 6 months at 250°F, and other test data (not included in this article) have shown that reheating for as long as 3 years at 212°F has not produced the maximum strengths attainable by aging 24S-T3 sheet (24S-T flat sheet) or 24S-T36 sheet (24S-RT flat sheet).

---

* *New "Alcoa" temper designations; old designations in parenthesis.*

It should be noted that as the degree of strain hardening present in 24S sheet increases from approximately the equivalent of 1 to 2 pct reduction in thickness for 24S-T3 sheet (24S-T flat sheet) to a controlled reduction of 5.5 pct in 24S-T36 sheet (24S-RT flat sheet) the time required to attain maximum strengths at a given temperature decreases sharply with an increase in reduction. Thus, where a range of time at a given temperature was mentioned in the preceding paragraph, it will be found as a rule that the shorter time is applicable to 24S-T36 sheet (24S-RT flat sheet), whereas the longer time will be required to produce maximum strengths upon artificial aging or reheating 24S-T3 sheet (24S-T flat sheet).

Heating these materials beyond the level of maximum strengths or the reheating of artifically aged 24S sheet (24S-T81, 24S-T84 or 24S-T86) at 250° or 300°F results in overaging which decreases the tensile and yield strengths as shown by figs. 1 and 2 and the data in table I. These decreases are evident after 4 to 6 months of reheating at 250°F, 2 to 4 weeks at 275°F, and 3 to 5 days at 300°F. Much longer periods will be required to produce overaging at temperatures below 250°F, while overaging will occur much more rapidly at temperatures above 300°F.

The resistance to corrosion of naturally-aged 24S sheet products, as evaluated from exposure by alternate immersion to a salt-peroxide solution, decreases rather rapidly during the first stages of reheating until maximum losses are at-

TABLE I

Mechanical Properties of 24S Sheet Products Reheated At 250° to 300°F and Tested At Room Temperature

Reheating Treatment	T.S., Psi.	Y.S., Psi.	Pct El. in 2 in.	T.S., Psi.	Y.S., Psi.	Pct El. in 2 in.	T.S., Psi.	Y.S., Psi.	Pct El. in 2 in.
	24S-T3[1] (24S-T flat sheet)			24S-RT[1] (3.5 pct)			24S-T36[1] (24S-RT flat sheet)		
Not reheated	66,050	43,050	19.5	68,300	50,300	15.5	72,000	52,250	17.0
1 day at 250°F	66,300	42,900	20.5	68,250	48,250	18.5	71,950	51,250	19.0
3 days 250°F	66,450	43,950	19.8	68,000	48,600	18.3	72,050	51,900	19.3
7 days 250°F	66,650	44,200	21.0	69,950	50,650	18.5	72,150	52,500	19.0
16 days 250°F	64,250	43,550	14.8	68,150	50,200	17.5	70,800	51,500	16.8
1 month 250°F	66,050	44,650	20.5	67,000	48,450	19.0	71,700	52,850	19.3
2 months 250°F	67,400	47,150	20.0	68,700	51,950	16.8	75,300	61,450	15.0
4 months 250°F	68,550	50,000	18.0	69,850	54,850	14.0	75,800	65,250	9.3
6 months 250°F	67,700	52,650	15.3	70,500	58,650	13.5	76,400	69,000	7.0
Not reheated	66,050	43,050	19.5	68,300	50,300	15.5	72,000	52,250	17.0
1 day at 275°F	64,850	41,900	20.0	67,600	48,500	17.5	74,200	55,850	16.3
3 days 275°F	64,550	42,500	18.0	66,850	46,550	18.0	72,800	55,800	16.0
7 days 275°F	65,100	43,100	19.0	67,000	48,600	18.5	73,750	57,550	16.0
2 weeks 275°F	67,350	60,750	7.3	69,950	63,900	7.0	74,950	69,450	6.8
1 month 275°F	65,150	56,050	7.5	66,600	56,750	7.5	70,900	61,600	6.5
2 months 275°F	66,200	56,750	7.0	66,850	56,900	7.0	71,200	61,400	7.0
4 months 275°F	65,300	56,950	7.3	66,700	57,250	7.8	70,800	62,150	7.0
Not reheated	66,050	43,050	19.5	68,300	50,300	15.5	72,000	52,250	17.0
1 day at 300°F	67,200	42,950	19.3	70,050	52,350	17.5	72,000	52,650	16.5
3 days 300°F	66,200	47,250	17.5	66,300	52,000	17.5	72,700	57,300	15.5
5 days 300°F	69,200	60,850	9.9	71,850	65,750	7.8	76,650	71,300	7.3
7 days 300°F	67,800	55,850	10.5	71,150	63,200	8.5	75,700	68,400	7.3
10 days 300°F	69,000	63,000	7.0	72,100	66,300	6.5	75,500	70,450	6.5
14 days 300°F	68,550	61,850	6.5	70,100	63,250	7.0	74,500	68,100	6.5
1 month 300°F	63,800	53,600	7.0	64,350	53,650	7.0	67,850	57,700	6.5
2 months 300°F	62,950	51,250	8.0	62,700	50,900	7.8	66,450	54,900	7.5
	24S-T81[2]			24S-T84[2]			24S-T86[2]		
Not reheated	68,150	61,750	7.0	71,300	65,950	7.0	77,500	73,750	5.5
1 day at 250°F	68,700	62,150	8.0	71,450	66,750	7.3	78,800	75,300	6.3
3 days 250°F	68,100	61,250	7.8	72,150	67,550	7.3	78,650	75,650	6.0
7 days 250°F	68,700	62,300	7.3	72,500	67,700	7.0	78,850	75,050	5.8
16 days 250°F	68,100	61,150	7.3	71,400	66,250	6.0	78,650	72,800	5.3
1 month 250°F	68,600	61,900	7.5	72,100	66,750	6.3	78,250	74,300	6.0
2 months 250°F	69,400	63,300	7.3	71,600	66,450	6.8	78,450	74,150	6.0
4 months 250°F	69,500	63,400	7.0	71,300	65,350	7.0	77,750	73,300	5.5
6 months 250°F	68,800	62,700	7.0	71,000	65,450	7.0	77,100	72,300	5.0
Not reheated	68,150	61,750	7.0	71,300	65,950	7.0	77,500	73,750	5.5
1 day at 275°F	67,600	61,000	7.0	71,150	66,200	6.0	78,200	74,700	5.3
3 days 275°F	68,100	62,350	7.3	73,650	68,200	6.3	78,750	74,800	5.8
7 days 275°F	68,850	62,550	7.0	71,300	66,300	6.8	78,900	74,650	6.3
2 weeks 275°F	65,950	57,850	7.5	68,950	61,550	6.8	74,100	67,800	6.0
1 month 275°F	63,950	54,800	7.5	66,050	56,850	7.0	70,950	61,950	6.5
2 months 275°F	64,050	54,600	7.5	67,050	57,350	7.0	71,300	62,150	6.0
4 months 275°F	63,650	55,000	7.8	66,500	57,700	7.5	71,000	62,700	7.0
Not reheated	68,150	61,750	7.0	71,300	65,950	7.0	77,500	73,750	6.8
1 day at 300°F	70,500	65,050	7.0	72,650	66,850	7.5	79,450	75,700	6.3
3 days 300°F	69,900	64,700	6.8	73,450	68,200	6.8	78,150	71,900	5.5
5 days 300°F	67,500	60,750	7.0	69,050	62,750	6.8	75,900	69,900	6.3
7 days 300°F	67,550	60,350	6.0	69,250	62,300	5.8	75,300	69,550	5.3
10 days 300°F	67,350	60,200	7.0	69,250	61,850	6.8	75,100	69,000	6.0
14 days 300°F	66,100	58,750	6.8	68,700	61,150	6.5	74,000	67,200	6.0
1 month 300°F	63,550	54,150	7.5	64,100	54,250	7.0	68,100	59,000	7.0
2 months 300°F	62,200	51,200	7.5	62,600	51,450	7.5	66,950	56,400	7.0

[1] Naturally-aged materials. [2] Artificially-aged materials. All tests average of 2 X-grain 0.064-in. thick sheet specimens.

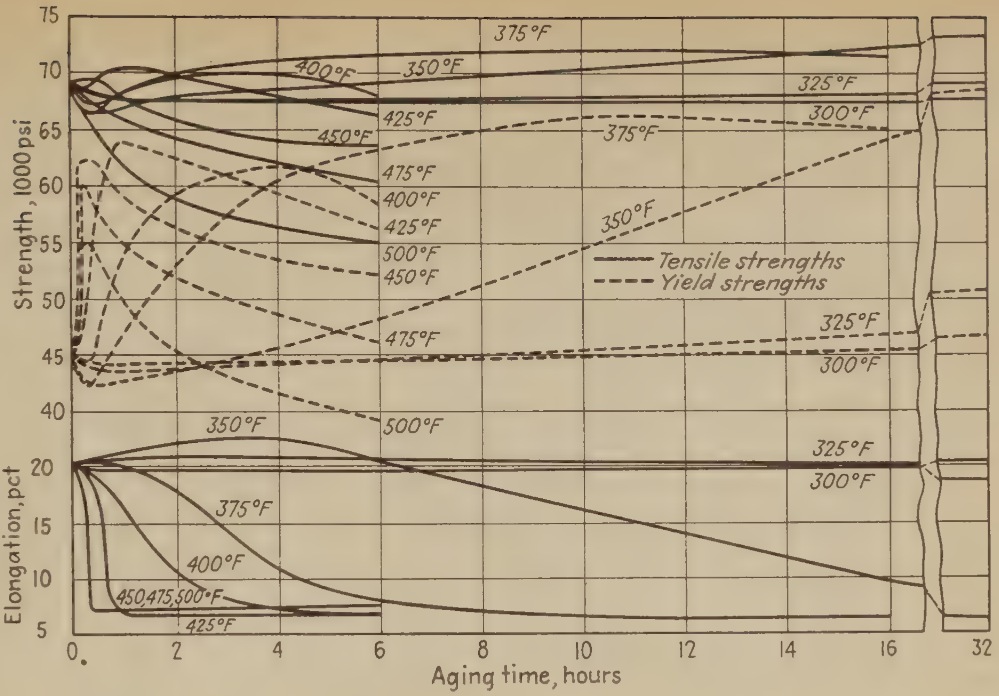


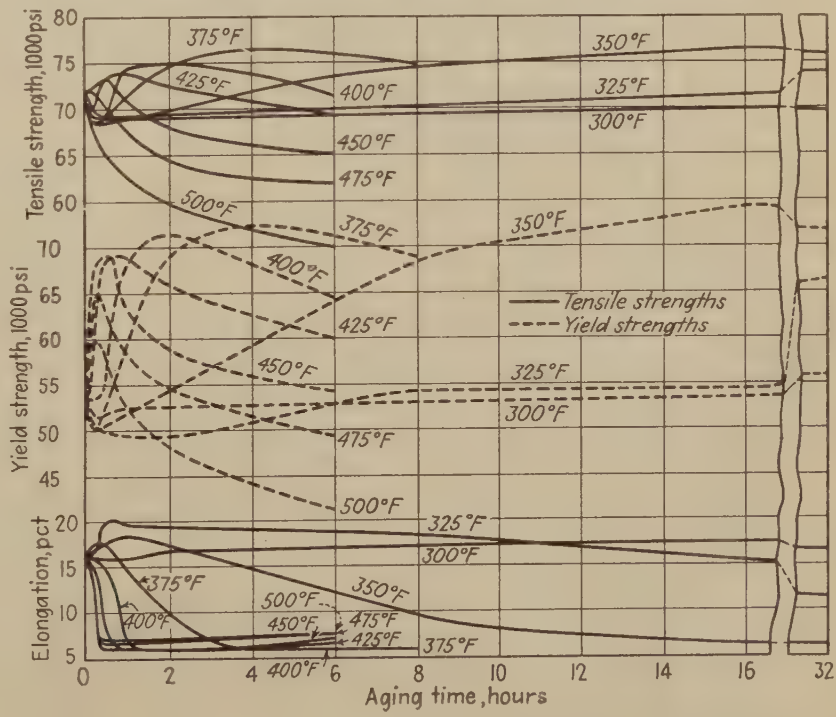
FIG. 1—Effect of aging temperature and time upon properties of 24S-T3 sheet (24S-T flat sheet). Solid lines indicate tensile strength values, and dash lines indicate yield strength values. X-grain specimens (0.064-in.) tested at room temperature.

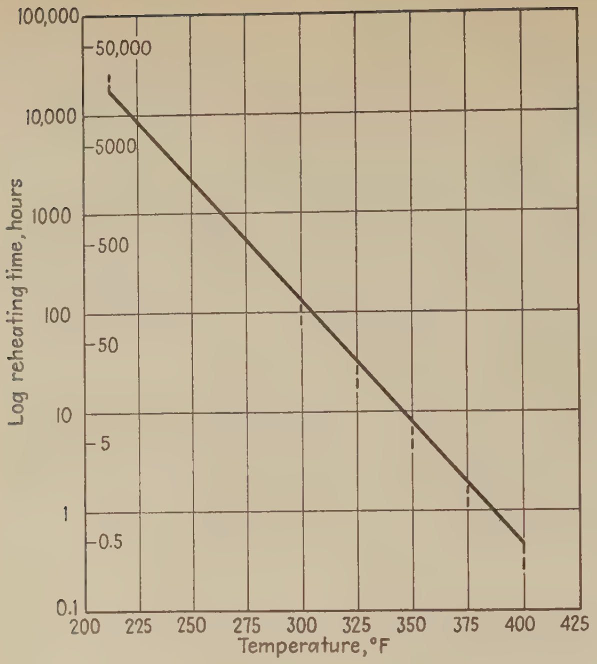
tained after the times shown in fig. 3. Additional reheating or artificial aging, beyond the stage of minimum resistance to corrosion, i.e., maximum losses will produce a decided improvement as regards corrosion behavior and, after certain periods of reheating, the resistance to corrosion of the reheated or artificially-aged material will be of the same general order as the naturally-aged material prior to reheating. The times required to secure this improvement in resistance to corrosion are shown in fig. 4 for temperatures over the range 350° to 450°F. The resistance to corrosion of artificially-aged 24S sheet products in the -T81, -T84, or -T86 tempers is not adversely affected by reheating, because the artificial aging treatments used to develop these tempers are of sufficient duration to produce materials with approximately the maximum resistance to corrosion.

The reheating of Alclad 24S sheet products, as previously mentioned for 24S sheet, is in effect equivalent to artificial aging, as shown in table II. The initial decreases in strengths are not shown since these tests did not include short reheating periods. The resistance to corrosion of the naturally-aged materials will be lowered by reheating or aging to a level comparable with that of Alclad 24S-T81, Alclad 24S-T84, or Alclad 24S-T86 sheet. The reheating of Alclad 24S-T81, Alclad 24S-T84, and Alclad 24S-T86 sheet samples is also covered by the data in table II. The changes in tensile properties follow the trend noted for similar 24S materials while the resistance to corrosion remains essentially unchanged.

The useful life of 24S or Alclad 24S sheet products exposed to elevated temperatures, for example, in construction adjacent to or forming an integral part of a de-icer unit in an aircraft structure, will be determined by the temperature used in a particular installation, the minimum strengths permitted in the design of the structure, and the period of time at the elevated tem-

FIG. 2—Effect of aging temperature and time upon properties of 24S-T36 sheet (24S-RT flat sheet). Solid lines indicate tensile strengths, and dash lines indicate yield strengths. X-grain specimens (0.064-in.) tested at room temperature.





ABOVE

FIG. 3—Reheating 24S-T3 sheet (24S-T flat sheet). Time at which losses in tensile strength under stress of 75 pct of yield strength in NaCl-H$_2$O$_2$ solution are a maximum. Commercially fabricated sheet; X-grain specimens (0.064-in. thick) tested at room temperature.

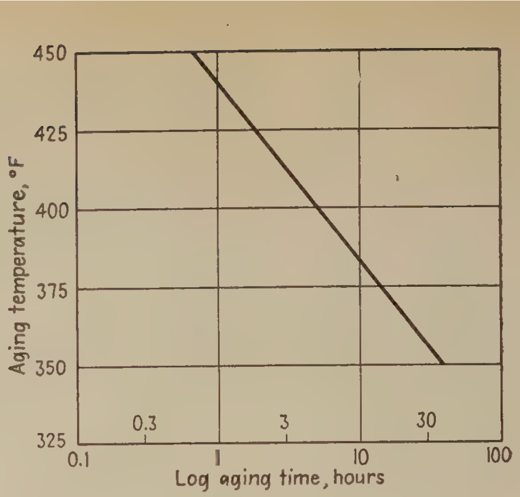
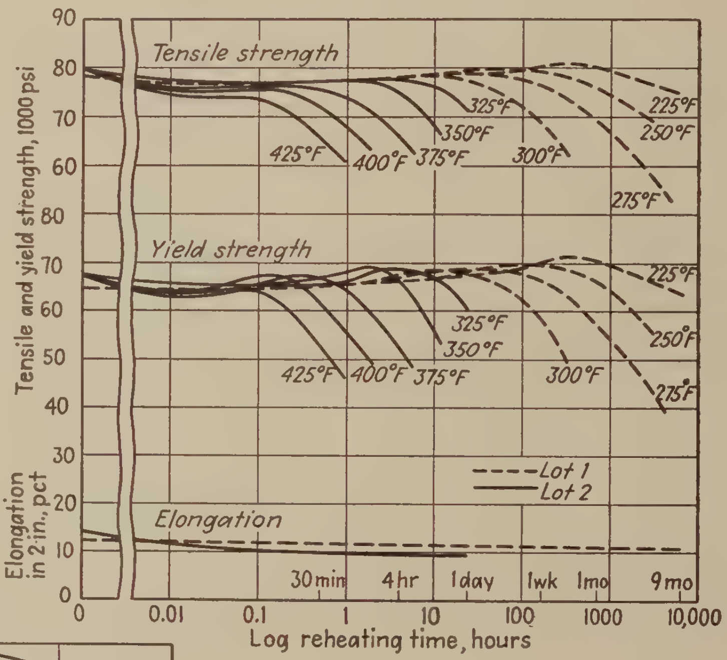


FIG. 4—Aging of 24S-T3 sheet (24S-T flat sheet) at 350° to 450°F. Logarithm of time to reduce tensile strength losses of 0.064-in. thick sheet under stress of 75 pct of yield strength in NaCl-H$_2$O$_2$ solution, to 20 pct.

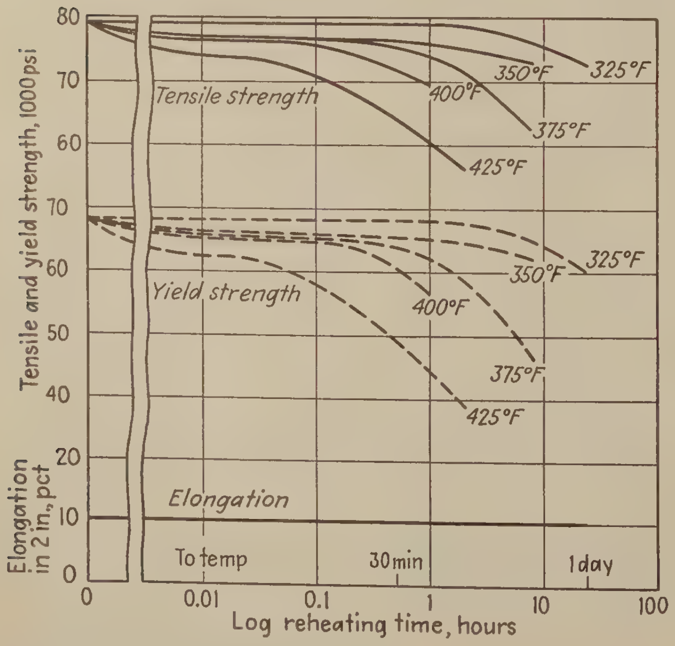
RIGHT

FIG. 5—Effect of reheating period upon tensile properties of Alclad 75S-T6 (Alclad 75S-T) sheet. X-grain specimens (0.064-in. thick) tested at room temperature.



BELOW

FIG. 6—Reheating of Alclad 75S-T6 (Alclad 75S-T) sheet aged by an interrupted procedure. All tests made at room temperature. Commercially heat-treated sheet; X-grain specimens (0.064-in. thick) aged at laboratories 4 hr at 210°F + air cool + 8 hr at 315°F.



perature. Properties obtained by reheating for 1500 hr at temperatures not exceeding 250°F indicate that a satisfactory service life both from the standpoint of mechanical properties and resistance to corrosion could be expected from Alclad 24S-T3 sheet (Alclad 24S-T flat sheet) and Alclad 24S-T36 sheet (Alclad 24S-RT flat sheet) and from the artificially-aged products of 24S and Alclad 24S sheet if the temperature did not exceed 250°F.

The expected life will be much shorter than that indicated at 250°F, when higher operating temperatures are encountered. Since the initial effect of reheating 24S-T3 sheet (24S-T flat sheet) and 24S-T36 sheet (24S-RT flat sheet) products beyond the initial re-solution period is that of artificial aging, which in turn lowers the resistance to corrosion, the use of naturally-aged materials of this nature is not recommended in the construction of parts exposed to elevated temperature. Reheating of artificially-aged 24S sheet products for forming is permissible so long as the mechanical properties are not adversely affected. The reheating of naturally-aged 24S sheet products for forming is not recommended, since mechanical properties are changed and resistance to corrosion is lowered by the reheating treatments that would be used.

Reheating of 75S and Alclad 75S Sheet

Reheating of 75S-T6 sheet (75S-T sheet) and Alclad 75S-T6 sheet (Alclad 75S-T sheet) is in most respects similar to reheating artificially-aged 24S sheet products. The initial effect of reheating 75S sheet products at temperatures from 225° to 425°F varies somewhat and is related to the reheating temperature and the prior artificial aging treatment. Slight decreases in strengths followed by increases to maximum values, after which rather rapid decreases occur, is typical of materials aged 24 hr at 250°F and reheated at 350° to 400°F, as illustrated in **fig. 5** and tables III and IV.

Reheating at temperatures below about 300°F produces continuous increases to maximum values followed by decreases, while at 400°F or above continuous decreases in strengths occur. Developments in artificial aging practices for 75S sheet products during the past year[1, 2] have resulted in the adoption of two interrupted two-step aging treatments consisting of (1) 4 hr at 212°F, cooling to room temperature and then aging for 8 hr at 315°F, and (2) 3 hr at 250°F, cooling to room temperature and then aging 3 hr at 325°F. Material aged by the former practice and then reheated at temperatures from 325°

TABLE II

Mechanical Properties of Alclad 24S Sheet Products Reheated At 250° to 300°F and Tested At Room Temperature

Reheating Treatment	T.S., Psi.	Y.S., Psi.	Pct El. in 2 in.	T.S., Psi.	Y.S., Psi.	Pct El. in 2 in.	T.S., Psi.	Y.S., Psi.	Pct El. in 2 in.
	Alclad 24S-T3[1] (Alclad 24S-T flat sheet)			Alclad 24S-RT[1] (3.5 pct)			Alclad 24S-T36[1] (Alclad 24S-RT flat sheet)		
Not reheated	62,950	39,350	20.5	63,850	43,800	18.0	68,350	51,000	16.0
1 day 250°F	62,800	40,600	20.5	63,750	42,750	19.8	68,150	49,250	18.0
3 days 250°F	63,400	41,150	20.8	64,200	44,150	20.0	67,700	49,600	17.8
7 days 250°F	63,050	41,550	20.8	64,750	45,200	19.8	69,250	50,700	19.3
16 days 250°F	61,700	40,600	20.8	63,600	44,650	17.3	67,700	49,950	17.5
1 month 250°F	62,550	41,800	19.3	63,400	46,050	17.0	67,800	51,750	15.5
2 months 250°F	63,350	44,150	18.0	64,500	47,000	18.3	69,250	55,650	14.0
4 months 250°F	63,400	46,350	17.0	65,600	50,400	14.5	70,500	59,000	12.8
6 months 250°F	63,300	48,500	15.5	66,050	54,050	12.8	71,200	62,750	11.0
Not reheated	62,950	39,350	20.5	63,850	43,800	18.0	68,350	51,000	16.0
1 day 275°F	61,750	40,000	20.3	62 600	41,550	19.8	67,250	48,300	16.5
3 days 275°F	61,500	40,250	21.5	62,900	44,250	19.0	66,050	48,450	18.0
7 days 275°F	62,250	41,200	21.0	63,250	44,100	18.5	66,850	50,500	16.8
2 weeks 275°F	63,700	57,150	6.5	65,350	59,350	6.0	68,500	60,900	6.8
1 month 275°F	61,100	51,650	6.8	61,950	52,500	5.3	64,750	54,850	6.8
2 months 275°F	61,100	51,450	7.0	61,950	52,550	7.0	64,750	54,850	6.8
4 months 275°F	61,850	52,800	7.0	61,900	52,750	7.0	64,900	55,700	7.0
Not reheated	62,950	39,350	20.5	63,850	43,800	18.0	68,350	51,000	16.0
1 day 300°F	62,900	40,350	18.5	64,250	44,900	18.0	71,750	56,500	16.8
3 days 300°F	61,800	42,600	20.0	67,600	50,750	16.5	70,050	61,250	13.0
5 days 300°F	64,800	55,450	9.8	67,300	61,200	7.3	71,950	67,250	6.5
7 days 300°F	63,600	52,150	11.3	66,850	58,350	8.5	73,800	69,450	5.8
10 days 300°F	64,700	58,050	6.4	67,100	61,450	6.5	70,350	64,350	6.0
2 weeks 300°F	63,750	56,950	6.8	66,050	59,350	6.3	69,150	62,150	6.3
1 month 300°F	58,900	48,900	6.5	60,350	50,000	6.5	61,800	52,600	6.5
2 months 300°F	58,550	46,850	7.8	59,500	47,650	7.3	60,550	49,750	7.0
	Alclad 24S-T81[2]			Alclad 24S-T84[2]			Alclad 24S-T86[2]		
Not reheated	64,750	58,450	7.0	66,550	61,250	7.0	74,200	70,050	5.0
1 day 250°F	64,000	57,450	7.3	66,950	62,400	6.8	75,700	70,850	5.8
3 days 250°F	64,050	58,000	7.0	67,000	62,300	6.5	74,850	70,750	6.0
7 days 250°F	65,250	59,350	7.5	67,600	62,900	6.5	74,900	70,200	6.0
16 days 250°F	63,850	57,100	7.0	67,450	62,200	6.0	74,100	69,400	5.5
1 month 250°F	64,550	58,150	6.5	67,100	62,100	5.8	74,400	69,500	5.0
2 months 250°F	65,000	58,250	7.5	67,200	61,800	6.5	74,450	69,450	5.5
4 months 250°F	64,450	57,500	7.0	67,050	61,500	7.0	74,250	68,700	5.5
6 months 250°F	63,800	57,300	6.5	66,200	60,850	6.5	72,900	67,550	5.8
Not reheated	64,750	58,450	7.0	66,550	61,250	7.0	74,200	70,050	5.0
1 day 275°F	63,750	56,750	7.5	65,900	61,100	6.5	72,500	68,300	5.3
3 days 275°F	64,100	58,000	7.5	65,200	60,500	6.3	71,800	67,800	5.5
7 days 275°F	65,000	58,700	7.0	66,300	61,950	6.3	71,950	67,200	5.8
2 weeks 275°F	62,200	54,200	7.0	63,400	55,700	6.8	67,800	60,050	6.0
1 month 275°F	60,300	51,050	7.0	61,150	51,950	7.0	64,750	55,700	6.8
2 months 275°F	60,400	50,950	7.5	61,450	52,300	7.0	64,500	55,550	6.0
4 months 275°F	60,700	51,550	7.3	62,200	53,250	6.5	65,950	56,600	6.5
Not reheated	64,750	58,450	7.0	66,550	61,250	7.0	74,200	70,050	5.0
1 day 300°F	66,650	60,550	7.8	67,700	61,950	7.0	72,300	67,450	6.0
3 days 300°F	66,450	60,700	6.8	65,000	60,100	6.5	72,600	67,950	6.3
5 days 300°F	63,600	56,400	7.0	65,250	58,200	6.5	70,750	64,200	6.0
7 days 300°F	62,900	55,550	6.3	64,550	57,750	6.0	68,650	61,950	6.0
10 days 300°F	61,900	54,700	7.5	64,900	57,650	6.5	67,600	60,400	6.0
2 weeks 300°F	61,350	53,500	6.5	64,450	56,750	5.8	70,300	62,700	5.8
1 month 300°F	59,450	49,500	7.0	60,600	50,300	7.0	62,900	52,950	7.3
2 months 300°F	59,200	47,450	7.5	58,400	47,940	7.0	61,050	50,200	7.3

[1] Naturally-aged materials. [2] Artificially-aged materials. All tests average of 2 X-Grain 0.064-in. thick sheet specimens.

TABLE III

Mechanical Properties of 75S-S-T6 Sheet (75S-T Sheet) Reheated At 225 to 300°F and Tested At Room Temperature[1]

Reheating Treatment	T.S., Psi.	Y.S., Psi.	Pct El. in 2 in.
Not reheated	80,900	66,550	14.8
1 day at 225°F	81,900	69,500	13.5
4 days 225°F	82,800	71,950	13.0
8 days 225°F	82,900	72,400	11.8
2 weeks 225°F	83,650	73,200	12.0
1 month 225°F	83,450	73,100	13.0
2 months 225°F	81,600	71,050	12.0
4.2 months 225°F	80,900	68,500	11.5
Not reheated	80,900	66,550	14.8
1 day at 250°F	82,900	69,200	13.3
2 days 250°F	83,250	71,750	13.3
4 days 250°F	83,250	72,550	11.8
8 days 250°F	82,850	72,450	12.0
2 weeks 250°F	81,150	70,700	12.0
1 month 250°F	80,450	68,750	12.5
2 months 250°F	77,750	65,400	11.8
4.2 months 250°F	75,150	61,350	11.0
Not reheated	80,900	66,550	14.8
12 hr at 275°F	81,000	69,650	12.0
1 day 275°F	81,050	69,650	12.0
2 days 275°F	81,000	70,300	10.5
4 days 275°F	80,650	69,450	11.0
1 week 275°F	79,500	69,100	10.5
2 weeks 275°F	77,450	66,500	11.0
1 month 275°F	72,300	60,300	10.3
Not reheated	80,900	66,550	14.8
4 hr at 300°F	80,550	68,500	12.0
8 hr 300°F	81,050	67,000	11.0
16 hr 300°F	80,950	70,050	11.0
1 day 300°F	80,750	69,900	11.0
2 days 300°F	77,650	66,800	11.0
4 days 300°F	77,150	66,450	11.0
1 week 300°F	73,800	62,300	10.0
2 weeks 300°F	68,800	56,000	10.5

[1] Material initially aged 24 hr. at 250°F. Values average of 2, X-Grain 0.064-in. thick sheet specimens.

to 425°F does not show the same changes in strengths noted for material reheated after aging 24 hr at 250°F.

The results, fig. 6, indicate that the strengths of Alclad 75S-T6 sheet (Alclad 75S-T sheet) aged by this two-step process, will begin to decrease after shorter periods of reheating and at a somewhat more rapid rate than material aged 24 hr at 250°F. Material aged by the most recently adopted two-step practice is expected to show the same trends upon reheating.

Generally, it has been found that the higher the reheating temperature, the greater the initial decrease in strengths, the shorter the period required to obtain maximum strengths, the lower the maximum values, and the more rapid the final decrease in strengths of material aged 24 hr at 250°F. The maximum yield strengths obtained on reheating at temperatures under 350°F were slightly higher than the original values. Materials aged by the two-step practice of 4 hr at 210°F plus 8 hr at 315°F, show a progressive decrease in strengths over the temperature range of 325° to 425°F inasmuch as the initial downward and upward trends have been overcome by the final artificial-aging step at 315°F. Similar results are expected for other two-step practices finishing at temperatures above 300°F.

Substantially the same maximum tensile and

TABLE IV

Effect of Reheating Alclad 75S-T6 Sheet (Alclad 75S-T Sheet) @ 350-450°F. Upon Properties At Room Temperature[1]

Reheating Time	T.S., Psi.	Y.S., Psi.	Pct El. in 2 in.	T.S., Psi.	Y.S., Psi.	Pct El. in 2 in.	T.S., Psi.	Y.S., Psi.	Pct El. in 2 in.
	Reheated @ 350°F			Reheated @ 375°F			Reheated @ 400°F		
Not Reheated	82,100	67,800	11.3	82,100	67,800	11.3	82,100	67,800	11.3
To Temp.	78,700	67,450	12.3	78,600	66,200	12.8	75,500	64,150	11.5
3 min	78,050	65,650	12.3	76,900	64,300	12.5	76,850	66,850	11.0
6 min	78,450	66,950	12.0	76,550	64,600	11.8	77,150	68,050	9.3
15 min	78,700	68.000	11.0	77,850	68,300	10.5	77,000	68,500	9.3
30 min	78,950	69,000	11.3	78,300	69,250	10.5	73,850	64,350	9.3
1 hr	79,900	70,600	9.8	77,660	68,400	9.3	69,350	57,800	9.5
2 hr	79,300	70,050	9.8	73,900	63,300	9.0	64,400	50,650	9.8
4 hr	77,500	68,000	9.3	69,800	57,600	9.5	59,000	44,450	9.8
8 hr	74,500	63,300	9.8	64,700	50,150	10.3	55,450	39,100	9.5
16 hr	70,100	57,550	9.8	59,300	43,500	10.0	50,150	33,400	9.5
1 day	68,000	53,400	10.0	56,400	40,100	10.3	48,350	31,450	9.8
2 days	62,150	47,100	9.5	52.250	35,500	10.0	44,950	27,800	10.5
4 days	56,850	40,550	9.8	48,400	31,000	10.3	41,500	24,300	10.5
1 week	53,000	36,550	9.8	45,350	28,050	10.3	41,150	23,000	10.8
2 weeks	48,200	31,850	10.5	42,750	25,200	10.8	38,900	21,050	12.8
1 month	45,750	28,600	10.0	40,900	23,550	10.0	37,500	19,350	12.8
2 months	41,900	25,000	11.0	38,200	20,500	11.8	......	.....	....

Reheating Time	T.S., Psi.	Y.S., Psi.	Pct El. in 2 in.	T.S., Psi.	Y.S., Psi.	Pct El. in 2 in.
	Reheated @ 425°F			Reheated @ 450°F		
Not Reheated	82,100	67,800	11.3	82,100	67,800	11.3
To Temp.	80,900	69,000	12.0	77,060	67,700	10.0
3 min	78,100	66,600	11.5	72,650	59,550	10.0
6 min	78,400	66,500	12.0	65,900	51,600	10.0
10 min	......	......	....	64,250	49,700	10.0
15 min	72,500	61,050	10.5	63,100	46,750	9.8
30 min	69,800	57,000	10.3	58,500	41,350	9.3
1 hr	63,100	48,100	10.0	54,200	37,100	10.0
2 hr	58,200	41,350	10.0	50,350	32,900	10.0
4 hr	53,400	36,200	10.0	47,150	29,500	10.5
8 hr	50,000	32,600	10.0	44,050	25,950	11.0
12 hr	......	......	....	42,900	24,500	11.0
16 hr	46,200	28,750	10.0	42,350	24,450	11.0
1 day	45,000	27,100	10.0	40,800	22,450	11.5
2 days	41,850	23,900	11.5	38,650	19,950	12.5
4 days	......	......	....	36,800	18,700	13.0
1 week	......	......	....	36,250	18,350	13.8

[1] Sheet initially aged 24 hr at 250°F.
Values average of 2, X-Grain 0.064-in. thick sheet specimens.

---

[1] *"Aging of 75S Aluminum Alloy,"* THE IRON AGE, *Nov.* 1, 1945, *p.* 64.

[2] *"New Short Time Aging Practice for 75S Aluminum Alloy Sheet,"* THE IRON AGE, *Jan.* 30, 1947, *p.* 57.

yield strengths were attained after reheating material, initially aged 24 hr at 250°F, at the following temperatures and time periods:

Temperature, °F	Hours
225	400
250	150
275	45
300	16
325	5
350	2
375	0.5
400	0.2
425	0.08
450	to temperature

The strengths of 75S-T6 and Alclad 75S-T6 sheet (75S-T and Alclad 75S-T sheet) aged 24 hr at 250°F show decreases of the following order after reheating for 1500 hr at the following temperatures:

225°F—no significant losses
250°F—5 to 10 pct decrease
275°F—20 to 25 pct decrease
300°F—30 pct decrease or more.

These results generally indicate that satisfactory service from the standpoint of mechanical properties could be expected from 75S-T6 and Alclad 75S-T6 sheet (75S-T and Alclad 75S-T sheet) for about 1500 hr at temperatures not exceeding 225°F. Naturally, the expected life of materials aged 24 hr at 250°F will be considerably shorter at higher reheating temperatures. Material aged by the two-step processes will have an expected life of still shorter duration as will be seen from a comparison of the data given in figs. 5 and 6 as the strengths of the latter materials will decrease at a somewhat faster rate than the material initially aged at 250°F.

Available corrosion data for 75S-T6, Alclad 75S-T6 (75S-T and Alclad 75S-T sheet) and similar sheet materials have shown no adverse effects upon resistance to corrosion or stress corrosion cracking from reheating in the range of temperatures considered in this article. Generally speaking slight improvements in these characteristics result from reheating and the major effect to be considered is that of mechanical properties. Reheating treatments which decrease the strengths below minimum specification values must be avoided.

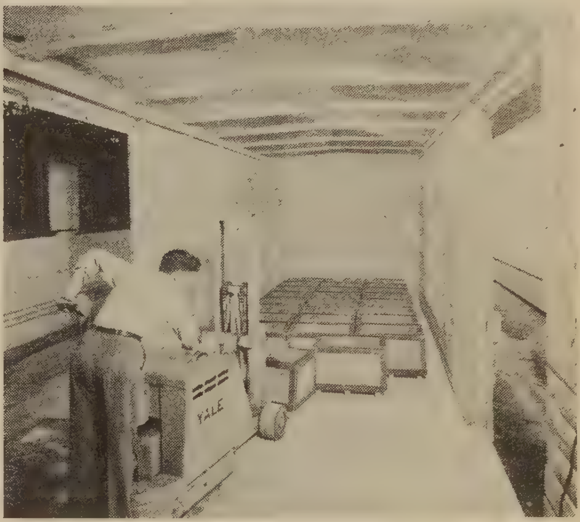
Electric Hand Trucks Increase Freight Carloads

FREIGHT carloads have been increased 24 pct at the Aliquippa Works of Jones & Laughlin Steel Corp. through the use of small size, electric, hand guided trucks which, because of their small size and short turning radius, reduce demurrage and enable fuller use of carrier facilities.

Freight cars can be loaded, as shown in the photo, so that only 6 ft of centerway is needed between the loadings on either side of the car door. This is in contrast to the 10-ft aisles required for turning by most ridden trucks, and is a marked advantage where, to insure against car door battering during transit, it is not permissible to fill this aisle space with pay load.

The truck used in this loading operation is a Yale Worksaver, a tilting fork type. The truck is guided in the same manner as a conventional hand truck, but lift, tilt and transport are battery powered. Both speed and direction are controlled from the handle.

At Jones & Laughlin a major application has been in loading tinplate, and the truck has enabled 62 tons per car to be loaded where 50 tons was the standard heretofore. In loading the tinplate, the same pallets on which the plate was handled in processing and inspection are used. This saves a handling step, and hence time and money, as it makes it unnecessary to lift the steel off the pallets onto the freight car floor.



SMALL size, hand guided truck loading palleted packages in a freight car. In one such operation, use of the truck has effected a 24 pct increase in the tonnage which can be loaded.

Angle reinforced, wire bound packages of the palleted tinplate, weighing 2000 to 3000 lb each, are loaded directly onto the carrier and are aligned with the car runners. Cleats nailed to the floor prevent transverse sliding.

The truck is also used at J&L for highway truck loading and for assorting mixed shipments. Drums, bales, crates, bags and many other package forms can be conveniently handled, and the truck's versatility makes it valuable in plant operations such as waste handling, especially in cramped quarters, when not being used in loading and unloading.

Selecting Alloy Structural Steels

○ ○ ○

By BERNARD S. LEMENT
Dept. of Metallurgy,
Massachusetts Institute of Technology,
Cambridge, Mass.

○ ○ ○

A simplified procedure for the selection of alloy steels for applications in which high toughness is required is described in this article. The method of selection of proper composition, which is based upon obtaining either complete or half martensitization and upon avoiding temper embrittlement, is limited to yield strengths in the range of 80,000 to 150,000 psi and to section sizes up to 5 in. in diam.

THE selection of the proper alloy structural steel for an application in which high toughness is required is often a difficult task. There are a large number of compositions to choose from even if the selection is confined to the standard SAE and NE heat-treating grades. Consideration must also be given to such complicating factors as hardenability, quench cracking and temper brittleness.

In the past the trial and error method was used to solve problems of alloy steel selection. The composition currently used in a similar application was tried, and as long as this particular steel appeared to perform satisfactorily in service, the problem was considered to be solved. If an epidemic of failures broke out, the procedure was to shift to another composition. This process was usually repeated until a steel composition was tried that gave satisfactory performance over an extended period of time. Even after such a steel was found, it was always questionable whether the steel was the optimum from the point of view of maximum safety factor and lowest overall cost.

Recent advances in metallurgical knowledge have made possible a more scientific approach to this problem. Alloy steels may be selected for applications requiring high toughness in a more direct fashion than the old trial and error method, and there is more confidence that the choice will be about the best that can be made under existing practical limitations. It is true that satisfactory performance in service is still required to confirm the choice made; however, there is far greater assurance that little benefit would result from using some other composition of alloy steel than the one selected in accordance with up-to-date metallurgical knowledge.

Unfortunately, no foolproof procedure exists for the selection of the optimum alloy steel composition for an application requiring high toughness. There are still wide gaps in necessary metallurgical data and there is considerable controversy over the interpretation of existing data. Theories on hardening, tempering, and the relation of composition, structure, and physical properties, are constantly changing. At the present time, however, enough is known upon which to base tentative procedures of alloy steel selection.

It is the object of this article to present a simplified procedure that will serve as a guide in the choice of alloy steels. For reasons that will be explained later, the suggested procedure is limited to yield strengths in the range of 80,000 to 150,000 psi, and to section sizes under 5 in. diam.

In brief, the method consists of the following steps: (1) Determine the yield strength needed in the part; (2) determine the equivalent diameter of the maximum section size to be heat treated; (3) decide which quenching medium should be used in hardening the part; (4) decide on the degree of martensitization that should be imparted by the hardening treatment; and (5) use table I to select the proper alloy steel for the part.

Yield Strength

Attainment of the desired yield strength is mainly a problem of selecting the correct tempering cycle providing that the steel has been properly hardened. For a constant tempering time, yield strength, like tensile strength and hardness, decreases with increasing tempering temperature. Since toughness, or impact resistance, as measured by the Charpy or Izod test also depends on tempering temperature, it follows that toughness and yield strength are interrelated.

In general, the toughness of an alloy steel is

for High-Toughness Applications

low after tempering at temperatures under about 800°F. With increased tempering temperature above about 800°F, toughness generally increases.

The rate of increase in toughness will depend on the susceptibility of the steel to temper embrittlement. In steels having low susceptibility, high values of toughness are attained after tempering above about 1000°F. In steels that have appreciable susceptibility, low values of toughness are attained in the temper brittleness range of 800° to 1200° F, unless water quenching from the tempering temperature is employed. Water tempering from the tempering temperature is usually effective if the tempering temperature is about 1100°F or higher, provided that the section size is not too large.

Since most alloy steels are susceptible to tem-

TABLE I

Yield Strengths Developed After 1100°F Temper in Alloy Steels Quenched in Maximum Section Sizes for Both Complete* and Half** Martensitization

MAXIMUM SECTION SIZE		YIELD STRENGTH (0.1 Pct Offset)									
		85,000 Psi		100,000 Psi		115,000 Psi		130,000 Psi		145,000 Psi	
Bar Diam., In.	Plate Thickness, In.	Water Quench	Oil Quench	Water Quench	Oil Quench	Water Quench	Oil Quench	Water Quench	Oil Quench	Water Quench	Oil Quench
½	⅓		1132-H	1132-C	2330-C 1330-H 1141-H		9430-C 5130-C 5140-C 9440-C 4042-H	4130-C 4042-C 4062-C	8640-C 4140-C 5150-C 1350-C		8740-C 9255-C
¾	½				3130-C	1330-C 1141-C 4032-H	2340-C 4130-H 1340-H 1350-H 4062-H				8650-C 8750-C 4150-C
1	⅝	1132-H	2330-H	2330-H 1330-H	3140-C	8630-C 9430-C 5130-C 1340-C 5140-C 4042-H	2350-C	4640-C 1350-C	9450-C		8950-C 9255-H
1¼	⅞			1141-H		9440-C	3141-C 3240-C	8640-C 4140-C 5150-C		8740-C 9255-C	
1½	1			3130-C	8630-H 9430-H 5130-H 2340-H	2340-C 4130-H 1340-H 1350-H 4062-H	3150-C 5140-H 4640-H		3250-C	8650-C 8750-C 4150-C	4340-C
1¾	1⅛	2330-H		3140-C	8640-H 2350-H	2350-C	8740-H 4140-H 5150-H			9255-H	
2	1¼				9440-H	3141-C 3240-C		9450-C		8950-C	
2¼	1½			8630-H 5130-H		4640-H			8650-H 8750-H 4150-H	4340-C	
2½	1⅝			9430-H 2340-H		3150-C 5140-H		3250-C			
2¾	1¾		3140-H	8640-H 2350-H		8740-H 5150-H					
3	2		3141-H	9440-H	3240-H	4140-H	9450-H				8950-H
3¼	2⅛							8650-H 8750-H			
3½	2¼		3150-H		3250-H			4150-H	4340-H		
3¾	2½										
4	2⅝	3140-H									
4½	3	3141-H		3240-H		9450-H				8950-H	
5	3¼	3150-H		3250-H				4340-H			

* The letter "C" after the alloy steel identification number signifies that complete martensitization is obtained after quenching.

** The letter "H" after the alloy steel identification number signifies that half martensitization is obtained after quenching.

TABLE II

Diameters of Round Bars Corresponding in Cooling Rate[1] to Various Positions Along Jominy Bar

Jominy Distance 1/16 In.	Diam. of Water Quenched[2] Round, In.	Diam. of Oil Quenched[3] Round, In.
1	0.45	0.20
2	0.70	0.35
3	0.95	0.50
4	1.20	0.65
5	1.45	0.80
6	1.65	1.00
7	1.90	1.15
8	2.10	1.30
9	2.30	1.45
10	2.55	1.60
11	2.75	1.75
12	2.95	1.90
14	3.30	2.15
16	3.70	2.45
18	4.05	2.70
20	4.35	3.00
22	4.65	3.25
24	4.90	3.50

[1] Cooling rate at center of bar.

[2] Water quench corresponds to Grossmann's severity of quench H value of 1.00.

[3] Oil quench corresponds to Grossmann's severity of quench H value of 0.30.

per embrittlement to some extent, it appears logical to temper in the vicinity of 1100° F and, where beneficial, water quench from the tempering temperature. Based on this reasoning, the selection of alloy steels for applications requiring high toughness is simplified. Alloy steels can be arranged on the basis of the yield strengths that are developed after tempering at 1100°F. This is done in table I, which also takes into account section size, type of quench, and degree of martensitization as will be explained later. The use of an 1100°F temper limits the yield strengths that can be attained in the standard SAE and NE steels to a range of 80,000 to 150,000 psi depending on carbon content, alloy content, and section size. An 1100° F temper also has the advantage of obtaining greater stress relief as compared with tempering at lower temperatures, and in addition, the heat-treated part can be finish-machined more easily.

Toughness and Temper Brittleness

It is realized, of course, that many articles are heat treated to yield strengths above 150,000 psi and still possess adequate toughness to function satisfactorily. It is necessary to temper these articles below 1100° F and thereby attain lower levels of toughness. It is the aim of this article to focus attention on the attainment of high levels of toughness such as result from tempering at 1100° F or above.

For applications in which yield strengths above 150,000 psi are required, the importance of minimizing temper embrittlement is becoming recognized to an increasing extent. Temper embrittlement can be alleviated to some degree by decreasing the overall alloy content, by using 0.25 to 0.50 pct Mo, and by keeping the manganese content at the minimum value consistent with good deoxidation practice. Research on the problem of temper brittleness is increasing in tempo and new alloy steel compositions that minimize susceptibility to temper embrittlement should become available in the near future.

Equivalent Diameter

By equivalent diameter of a given part is meant the diameter of a solid round that would have the same cooling rate at its center as at the center of the maximum section of the part in a given quench-hardening treatment. Determination of the equivalent diameter of the maximum section size can usually be done by simple measurement if the part is of cylindrical shape. The equivalent diameters of uniform plates possessing thicknesses in the range 1/3 to 3 in., as given by Lamont[1] are included in table I and are approximately one and one half times their geometric thicknesses.

In general, parts may be neither completely cylindrical, completely flat, nor completely solid but may possess quite irregular shapes. The equivalent diameter of a complicated shape can be determined by the hardness-cooling rate curve method of Boegehold[2]. In essence, this method consists of determining the cooling rates throughout a given part when quenched under specific conditions. By this method, the position on a Jominy hardenability bar corresponding to the slowest cooling rate in the part can be readily determined. From this Jominy distance and use of table II it is possible to determine the equivalent diameter of the part. Table II was derived from the hardenability charts of Grossmann and Asimow[3]. In this table are values of Jominy distance that correspond in cooling rate to the centers of bars varying in diameter from ½ to 5 in. quenched in water or oil. If, for example, the slowest rate of cooling in a part hardened by quenching in oil were found to correspond to a Jominy distance of 6/16 in., table II shows 1 in. to be the value of equivalent diameter.

It should be borne in mind that this article is concerned with section sizes up to 5 in. in equivalent diameter. If the equivalent diameter is over 5 in., it probably will be necessary to use a special alloy steel composition not included in the standard SAE or NE series. On the other hand, if the equivalent diameter is ⅜ in. or under it should be possible to use a plain carbon steel.

The choice of a suitable quenching medium for the hardening treatment usually amounts to choosing between water and oil. Water quenching, although more drastic than oil quenching, has the advantage of permitting the use of steels of lower alloy content and/or lower carbon content. Water quenching has the disadvantage of increasing the danger of quench-cracking. The chief criterion in the selection of quenching medium is the design of the part, although the composition of the steel used is also a factor. Designs which are susceptible to cracking when quenched in water can usually be quenched safely in oil. In troublesome cases, interrupted quenching or martempering can be employed. The majority of parts, however, are hardened using either water or oil as the quenching medium.

Degree of Martensitization

By degree of martensitization is meant the amount of martensite that is obtained at the center of the maximum section after quench-hardening. Complete martensitization signifies a 100 pct martensitic structure* from surface to center. Half martensitization means obtaining structures varying from 100 pct martensite* at the surface to 50 pct martensite at the center.

It is generally accepted that a tempered martensite structure confers higher toughness than any other metallographic constituent at hardness under about 400 Bhn. It would therefore follow that a 100 pct martensitic structure should be obtained at least at the surface of a part in which high toughness is required.

Not enough is known at the present time to decide to what depth a 100 pct martensitic structure should extend or how much of the various transformation products other than martensite can be tolerated in the interior of a part. In view of these uncertainties, the safest procedure is to obtain complete martensitization. However, if limited to standard SAE and NE steels, complete martensitization can only be obtained in rounds up to about 2½ in. diam with water quenching, and up to about 1½ in. diam with oil quenching.

In sections above these size limits, incomplete martensitization will result although a 100 pct martensitic structure may extend in for an appreciable distance from the surface. In the interest of simplification, it is recommended that in small sizes complete martensitization be obtained where possible; and that at least half martensitization be obtained in large sizes where it is not possible to obtain complete martensitization. When more knowledge becomes available as to the optimum depth for 100 pct martensitic structure and as to what mixtures of structures at the interior are satisfactory, the above recommendations should be modified accordingly.

In some parts of variable section, due to localized service stresses, it may be necessary that only the smaller size sections possess high toughness. In such cases it may suffice to obtain complete martensitization in the smaller sections and allow a high degree of incomplete martensitization in the maximum size section.

Description of Procedure

When both the yield strength and equivalent diameter have been determined and both the quenching medium and degree of martensitization have been decided upon, selection of the proper alloy steel may be carried out by use of table I. This table gives the yield strengths developed after an 1100°F temper in most of the standard SAE and NE steels quenched in maximum section size to obtain center structures of 50 pct and 100 pct martensite respectively.

TABLE III

Maximum Diameters of Alloy Steel Rounds Quenched to Obtain Center Structures of Both 100 and 50 Pct Martensite

STEEL	Max. Diam. Having Center Structure of 100 Pct Martensite			Max. Diam. Having Center Structure of 50 Pct Martensite		
	Ideal Quench	Water Quench	Oil Quench	Ideal Quench	Water Quench	Oil Quench
SAE 1132...	1.4	0.65	0.3	1.8	1.0	0.45
SAE 1141...	1.3	0.8	0.35	1.7	1.2	0.6
SAE 1330...	1.4	0.7	0.35	1.9	1.1	0.55
SAE 1340...	1.6	0.9	0.4	2.2	1.4	0.7
SAE 1350...	1.8	1.1	0.5	2.4	1.6	0.85
SAE 2330...	1.9	1.1	0.55	2.5	1.7	0.9
SAE 2340...	2.4	1.6	0.85	3.2	2.4	1.5
SAE 2350...	2.7	1.8	1.0	3.6	2.8	1.8
SAE 3130...	2.2	1.4	0.7	3.7	2.8	1.8
SAE 3140...	2.7	1.8	1.0	4.8	4.0	2.7
SAE 3141...	2.9	2.0	1.2	5.3	4.4	3.0
SAE 3150...	3.3	2.5	1.6	5.9	5.0	3.5
SAE 3240...	2.9	2.0	1.2	5.2	4.4	3.0
SAE 3250...	3.2	2.4	1.5	5.8	5.0	3.5
SAE 4032...	0.8	0.3	0.1	1.5	0.8	0.35
SAE 4042...	1.0	0.45	0.2	1.8	1.1	0.5
SAE 4062...	1.3	0.65	0.3	2.3	1.5	0.75
SAE 4130...	1.2	0.6	0.3	2.2	1.4	0.7
SAE 4140...	2.1	1.3	0.65	3.7	2.9	1.7
SAE 4150...	2.3	1.5	0.75	4.2	3.4	2.2
SAE 4340...	3.1	2.3	1.5	5.7	4.9	3.5
SAE 4640...	1.6	0.9	0.4	3.0	2.3	1.4
SAE 5130...	1.7	1.0	0.45	3.0	2.3	1.4
SAE 5140...	1.8	1.1	0.5	3.2	2.4	1.5
SAE 5150...	2.0	1.2	0.6	3.6	2.8	1.8
NE 8630.....	1.6	0.9	0.4	3.0	2.3	1.5
NE 8640.....	2.0	1.2	0.6	3.6	2.8	1.8
NE 8650.....	2.2	1.4	0.7	4.1	3.3	2.2
NE 8740.....	2.0	1.2	0.6	3.6	2.8	1.8
NE 8750.....	2.2	1.4	0.7	4.1	3.3	2.2
NE 8950.....	2.8	1.9	1.1	5.3	4.4	3.0
NE 9255.....	2.0	1.2	0.6	2.7	1.8	1.0
NE 9430.....	1.8	1.1	0.5	3.2	2.4	1.5
NE 9440.....	2.1	1.3	0.65	3.8	3.0	2.0
NE 9450.....	2.8	1.9	1.1	5.2	4.4	3.0

Maximum section sizes for each alloy steel are based on the pearlitic and bainitic hardenability calculations of Holloman and Jaffe[4]. They calculated values of ideal diameter representing the pearlitic and the bainitic hardenability of the median chemical composition of various SAE and NE alloy steels. According to their concept, the lower ideal diameter value for a given steel indicates whether pearlite or bainite limits its hardenability. Such lower values of ideal diameters based on center structures of 100 pct and of 50 pct martensite are listed in table III, which also includes the corresponding water-quenched and oil-quenched maximum sizes as obtained by use of the conversion charts of Grossmann and Asimow[3]. The yield strength values that would be attained in these maximum section sizes after tempering at 1100°F for 1 hr per in. of section were obtained from several sources[5-10].

For sections under 1 in. in diam, the yield strength values of table I correspond to the center position. For sections over 1 in. in diam, the yield strength values correspond to a position midway between center and surface. Certain standard alloy steels are not included in table I because of lack of necessary yield strength data. Other standard steels such as 1335, 2335, 3135, etc. (which end with the number 5), have been omitted because their positions in table I

** Minor amounts of retained austenite may be present, but are usually neglected in these considerations.*

can be determined from the positions of steels of the same series differing in carbon content by only 0.05 pct.

In order to use table I, first look down the column under the heading of maximum section size until the equivalent bar diameter or plate thickness of the part is reached. Moving horizontally to the right, a column headed by both the required yield strength value and the selected quenching medium is reached. The block corresponding to the correct section size, yield strength, and quench, will contain from none to as many as six steels. Steels in such blocks are denoted by their usual identification number except for the SAE or NE prefix. The suffix C following the alloy steel identification number stands for complete martensitization and signifies that a center structure of 100 pct martensite is obtained after quenching. The suffix H stands for half martensitization and signifies that a center structure of 50 pct martensite is obtained after quenching. If complete martensitization is desired, the H steels are disregarded; if half martensitization is desired, the C steels are disregarded.

Even after this breakdown there still may be more than one steel that fits the requirements. The steels in each block are therefore listed in the order of preference based on carbon and alloy content. The steel with the lowest carbon content and lowest cost alloy content is considered to be the first choice for the part. In the range of carbon contents considered, the lower the carbon content the higher is the toughness of a tempered martensitic structure. Low carbon is also helpful from the standpoint of reducing the susceptibility to quench cracking. Low cost alloy content is important from the standpoint of economy; however, this is usually a secondary consideration. If no steels are listed in a given block, a selection should be made from either one of the blocks below or to the right of the empty block. In such a case, the decision as to which steel to select should be based on the carbon and alloy contents of the steels in these neighboring blocks. In general, the steel with the lowest carbon content is preferred. If the carbon contents of two steels are the same, then the one with the lower cost alloy content is preferred. If a selection is to be made from a block to the right of the empty block, the block to the right must be under the heading of the proper quenching medium. Since blocks to the right correspond to higher yield strengths, a steel selected from such a block will have to be tempered at a higher temperature than 1100°F in order to attain the required yield strength.

Practical Examples

As examples of the use of the method, two problems of alloy steel selection will be considered:

Problem 1—Cylindrical Shaped Part

Required yield strength...115,000 psi
Maximum section size....½-in. diam round
Quenching medium ....oil
Degree martensitization...complete (100 pct martensite at center)

Referring to table I, it is found that the above requirements are fulfilled by the following steels: 9430, 5130, 5140, and 9440. The first choice is 9430 which is a NE steel. If this steel is not available, the order of preference is as given.

Problem 2—Plate Shaped Part

Required yield strength...120,000 psi
Maximum section size....2¼-in. thick plate
Quenching medium ......oil
Degree martensitization...half (50 pct martensite at center)

Realizing that the 120,000 psi yield strength requirement is closer to 115,000 than to 130,000, and referring to table I, it is found that no steels are listed in the block corresponding to the above requirements. However, in the second block to the right, the steel 4340 is listed. In a 2¼-in. thick plate of SAE 4340 steel, half martensitization will be obtained after an oil quench, and a yield strength of 130,000 psi will be attained after tempering at 1100°F. To obtain the desired yield strength of 120,000 psi using SAE 4340 steel, the part will have to be tempered above 1100°F.

References

[1] J. Lamont, "How to Estimate Hardening Depth in Bars," The Iron Age, Oct. 14, 1943, p. 64.

[2] A. L. Boegehold, "Use of Hardenability Tests," SAE Trans., vol. 49, No. 1, p. 266.

[3] M. A. Grossmann and M. Asimow, "Hardenability and Quenching," The Iron Age, Apr. 25 and May 2, 1940.

[4] J. H. Holloman and L. Jaffe, "Ferrous Metallurgical Design," John Wiley & Sons, 1947, p. 210.

[5] Samuel L. Hoyt, Metals and Alloys Data Book.

[6] American Iron & Steel Institute, "Contributions to the Metallurgy of Steel, No. 10."

[7] Republic Steel Corp., National Emergency Steels.

[8] Republic Steel Corp., Republic Alloy Steels.

[9] International Nickel Co., Nickel Alloy Steels.

[10] Carnegie-Illinois Steel Corp., U. S. Carilloy Steels.

Japanese Magnetic Materials

FOUR magnetic materials, said not to be made in the United States, are being produced in Japan, according to a report based on investigations by the United States Naval Technical Mission to Japan. The materials are of particular interest in connection with the development of magnetic amplifiers or transconductors requiring high permeability magnetic core materials for efficient operation.

The materials are an aluminum-iron alloy, Alfer, developed as a substitute for nickel; Sendust, a high permeability alloy of iron, silicon, and aluminum; and two permanent magnet materials which were developed and known before the war.

An important new application of magnetic materials in Japan has been the use of the Alfer alloy in magnetostriction projectors and microphones. It was also used to replace nickel in the cores of underground vibrators and receivers.

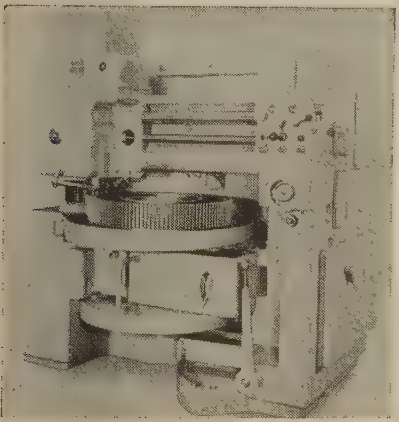
Japanese scientists carried out considerable research to determine if magnetic amplifiers could be used in place of three stage vacuum tube amplifiers or as relays in automatic communications circuits, according to the report, but no practical application was made.

New Equipment . . .

A new general purpose gear shaper for cutting external and internal spur and helical gears, a double ended automatic profiling machine, automatic welding equipment and controls, heavy duty impact crushers, a magnetic separator, a plastic tester, and an optical projection comparator are described this week together with several material handling units.

Gear Shaper

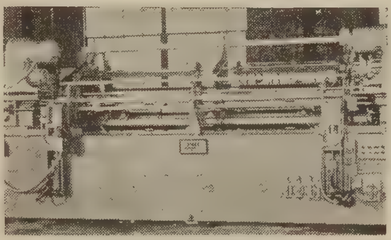
DESIGNED for general-purpose gear cutting, a gear shaper of massive construction, and adapted to the cutting of external and internal spur and helical gears, has been placed on the market by *Fellows Gear Shaper Co.*, Springfield, Vt. The one-piece cutter-spindle is designed to carry a 5-in. cutter and is operated by a heavy and rigid reciprocating mechanism. The apron carrying the work-spindle which has a 5⅞-in. straight hole, is supported in the base integral with the cabinet. Twelve different reciprocating speeds ranging from 18 to 300 strokes per min are obtainable through a selecting dial.



Four rotary feeds are available through a 4-speed transmission. The cutter can be fed into depth by independently adjustable steps, as determined by the number and position of the dogs. Rotation of the work is determined at any depth of cut by a counter.

Profiling Machine

FOR high production end-machining operations such as turning, boring, chamfering, burring, threading and tapping, *Pines Engineering Co.*, Aurora, Ill., has announced a line of general duty automatic profiling machines. On one production job the machine is said to chamfer both ends of ½ in. conduit, 10 in. long, at the rate of 800 to 1000 pieces per hour; and the same machine is said to simultaneously chamfer both ends of screw machine rod stock at the rate of 700 to 800 pieces per hour. The profilers are built for manual or fully automatic operation. Automatic types are equipped with hydraulic controls which repeat the machining sequence continuously. With the work hydraulically chucked, one or both ends are machined by the action of rotating heads, which hold the cutters. Either one or two heads may be employed; two heads permitting the simultaneous machining of both ends of the work. Machines handle work ranging from less than an inch in length up to 60 ft.

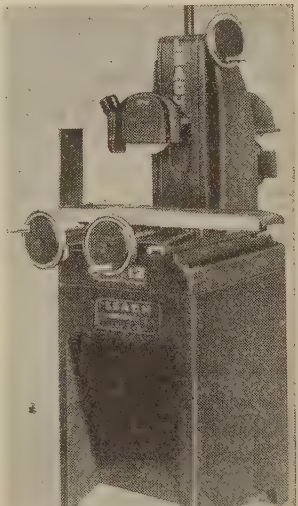


Automatic Welding Equipment

EQUIPMENT for automatic welding consisting of welding head, control equipment, welding transformer and work position equipment, is available in one single package from *Westinghouse Electric Corp.*, 306 Fourth Ave., Pittsburgh 30. The standard weldomatic head, designed to rotate 360° in the vertical or horizontal plane, is suitable for welding with ac or dc, and operates with a capacity of 1200 amp ac. Special nozzles are available for 2000 amp ac. Capacity for dc welding is 800 amp. Nozzles and knurled drive wire feed rolls are supplied to accommodate ⅛, 5/32, 3/16, and ¼-in. wire diam. Wire feed is automatic. The speed of the driving motor is controlled by the burn off rate of the welding wire through a bridge hook-up consisting of arc voltage, control generator field and a potentiometer. The motor-generator set is driven by a 2 hp, 220/440 v, 3 phase, 60 cycle ac motor.

Surface Grinder

ANNOUNCEMENT of a 6 x 12 x 10½-in. surface grinder featuring modern streamlined design has been made by *H. Leach Machinery Co.*, Providence, R. I. It is a self-contained unit with a two-speed ball-bearing spindle, motor driven by a ¾ hp motor and completely equipped with dust guards. The grinder uses a standard 5 x 10-in. magnetic chuck, 7 x ½ x 1¼-in. wheel, and standard wheel adapter. The hand operating wheels are centrally located for ease of operation and top visibility.



General Purpose Welders

SEVERAL general purpose limited input transformer type welders have been added to the line of welding equipment manufactured by *Trindl Products, Ltd.*, 17 E. 23rd St., Chicago 16. The welders are for single phase rural and other power lines of limited capacity. They are available both with and without power factor correction in output ratings of 130 and 180 amp. Standard equipment includes headshield, electrode holder, welding ground and power cables, wall receptacle and welding rods. These models, designated 130B, 130C, 180B and 180C are recommended for general maintenance and production welding.

Welder Controls

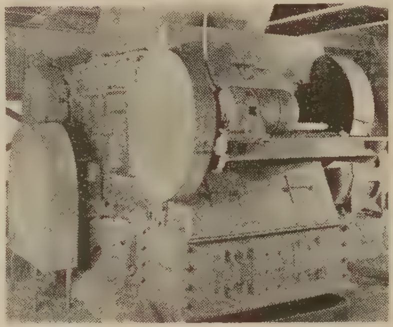
PRODUCTION of non-synchronous controls for use with foot, air, motor and hydraulically operated spot, projection, butt and seam resistance welders, has been announced by *Taylor-Winfield Corp.*, Warren, Ohio. Accurate timing is provided by dc timing circuits, with accurate setting made possible by timing dials graduated with wide range at short time settings, or graduated in cycles for frequencies of 60, 50 and 25 cycles per sec. Timers for pulsation welding have the impulse timer dial reading directly in the number of impulses desired. Controls are a complete and compact packaged unit.

Copper-Nickel Electrode

FOR making machinable welds on cast iron, an electrode, Hobart Softcast A, has been developed by *Hobart Bros. Co.*, Troy Ohio. It is a copper-nickel alloy electrode having a mineral flux coating for metallic arc welding. The weld deposits are nonferrous, light gray in color, malleable, machinable, and said to have a tensile strength equal to good cast iron. These electrodes are available in 3/32, ⅛, 5/32 and 3/16 in. diam in 18-in. lengths, center brushed. They may be used on ac or dc current.

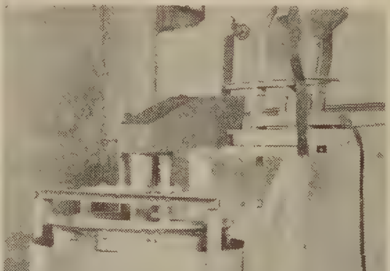
Impact Crushers

DESIGNED for the reduction of all wet, sticky clay, ores, limestone, etc., impact crushers with traveling breaker plate have been built by *Jeffrey Mfg. Co.*, 950 N. 4th St., Columbus 16, Ohio. One machine, 42 x 50 in. reversible size, has a traveling breaker plate on each end of the crusher. The plates are individually driven through gear head motors. Both plates are adjustable with relation to the distance from the tip of the hammers, making it possible for one size product to be run on one side of the machine and another size product to be obtained by simply reversing the rotor. This crusher will accommodate a feed of approx 40 in. sq x 18 in. thick. A non-reversible type is built in a 36 x 24 in. size.



Magnetic Separator

DESIGNED especially for the concentration of finely divided magnetite ores, but also having application for the removal of magnetic particles from cutting oils, the separation of minute iron particles in solution, and any other problem involving the separation of magnetic material from non-magnetic material, a cone wet type continuous magnetic separator has been developed by *Magnetic Engineering & Mfg. Co.*, Clifton, N. J. The material to be separated, which is in solution with three or more parts of liquid to one part of solids, is fed to the top of the magnetic separator. Separation is made in the machine and the magnetic material is discharged from one outlet and the non-magnetic material discharged from the other outlet. The machine is built in sizes ranging from 2 to 10 ft diam, and in multiples from 1 to 4 stages of operation. It operates continuously without any attention from the operator.

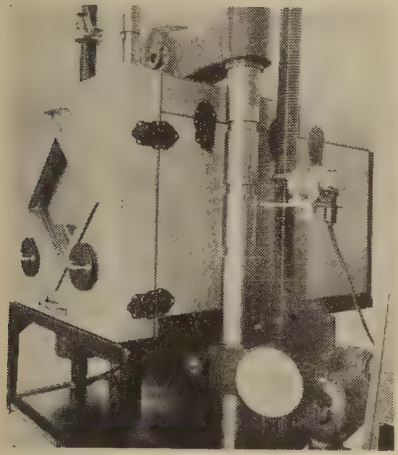


Electric Metal Heater

ANNOUNCEMENT of the No. 4 three-electrode type L electric metal heater, equipped with electric eyes for temperature control, has been made by *Frank C. Cheston Co.*, 38 Park Row, New York 7. The unit heats pieces from ⅝ to 1½ in. diam and any length from 1 to 24 in. By the contact resistance method of heating, each Btu in a kw-hr must enter the piece being heated; the only loss is by radiation. No current is consumed until the piece is gripped by the electrodes and the current is immediately cut off when the piece reaches the temperature to which the photoelectric controller has been set. Photoelectric controllers are placed over each electrode. It is claimed this method of heating reduces the tendency to scale.

Plastics Tester

FOR determining the physical properties of plastics in tension, compression and flexure over the specification range of temperature of −70° to 170°F, *Baldwin Locomotive Works*, Philadelphia 42, has developed a temperature-controlled cabinet for use on standard Baldwin-Tate-Emery testing machines of 60,000 and 120,000 lb capacity. The working chamber of the cabinet, approximately 19 in. wide x 18 in. high x 20 in. deep, accommodates Templin type specimen grips of 5000 lb capacity, a sub-press for compression testing, flexure tool, standard strain followers for either Templin or Microformer type recorders, and associated equipment. Standard 2-in. gage length tension test specimens, compression specimens 2x½x½ in., or flexure test specimens up to 16 in. span x 2 in. wide x 2 in. thick can be tested in the chamber. The chamber permits a deformation of 2 in. in the tension and flexure specimens. A servo unit behind the working unit consists of a dry ice container, a mixing chamber, fan for air circulation, heater coils and electric temperature control equipment. The cabinet is stainless steel with 4 in. of thermal insulation.

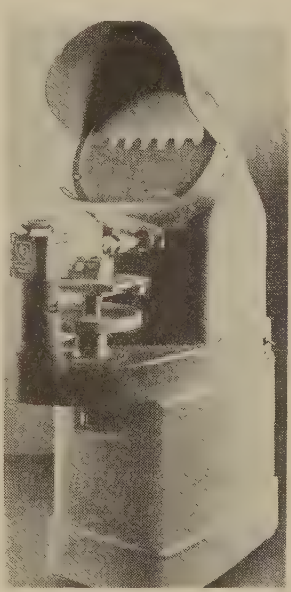


Sample Changer

DEVELOPED to protect radioactivity laboratory personnel, a lead shielded manual sample changer and preamplifier designed by *Tracerlab, Inc.*, 55 Oliver St., Boston, is said to permit faster, more accurate counting of a large number of radioactive samples. It consists of a 2-in. lead shield of outside dimensions 11⅝ in. high x 6½ in. diam to lower background count by a factor of 3 to 5. The upper section of the shields holds a preamplifier circuit and Tracerlab G-M tube. A stainless steel sample holder is mounted in a slide in the lower portion of the lead shield. Samples can be loaded from either side. The holder is designed to take standard 1-in. diam samples on planchets, filter paper, and in ashing dishes as well as standard radioactivity reference sources. Geometrical reproductivity within 0.1 pct is said to be attained.

Projection Comparator

ADAPTABLE for inspection of production pieces or as a microscopically precise measuring device, an optical projection comparator manufactured by the *American Optical Co.*, Southbridge, Mass., and distributed by *Universal Engraving & Colorplate Co.*, Buffalo, N. Y., has interchangeable magnifications of 10X, 20X, 31.25X, and 62.5X. The instrument features a viewing screen of 16 in. diam, parfocal and paramagnified lens systems, coated lenses for transmitting more light for bright screen illumination, and finger-tip focusing. The work stage has a 4-in. vertical travel and accommodates the lock-fast cams of most standard fixture bases. The hood, base and pedestal are cast aluminum. The basic unit is usable either on a bench or its own pedestal.



1000-Lb Fork Truck

ANNOUNCEMENT of the type FQH-10 center control fork truck which has been designed to meet the need for a small, lightweight fork truck of 1000-lb capacity, has been made by the Baker Industrial Truck Div., *Baker-Raulang Co.*, 2168 W. 25th St., Cleveland 13. This truck has a 36-in. wheelbase and an overall length, exclusive of forks, of 53⅝ in. To make right angle turn the truck requires only 67½ in. plus the 30-in. length of the 1000-lb load. The truck is 28 in. wide, weighs 3800 lb with load, and has a travel controller which provides three speeds forward and reverse. It is operated, from a seated position, by a treadle which operates a foot switch connected in the contactor circuit, and can be started only with the controller in first speed. The truck is offered in a complete package which consists of truck, battery, and charger.

Air and Hydraulic Valves

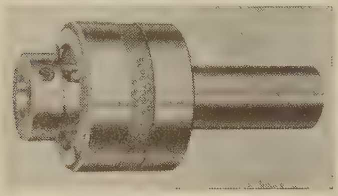
UNITITE valves for air and hydraulic lines redesigned to incorporate a protective dust seal have been announced by *Hanna Engineering Works*, 1765 Elston Ave., Chicago 22. The seal consists of a neoprene skirt mounted on the valve stem underneath the handle to shroud the boss on the bonnet, thus protecting the working parts from dust. A modification has also been made in the lubrication fitting. The fitting is mounted in the stem so that the valve disk and stem are pressure lubricated radially outward from the center. Lubrication is said to be accomplished without taking the valve out of service or shutting off the flow.

Variable Pitch Sheave

A STEEL fractional horsepower variable pitch sheave which is adjusted through 20 threads has been announced by *Dodge Mfg. Corp.*, Mishawaka, Ind. This sheave is made in eight pitch diameters ranging from 1.9 to 2.9 in. through 3.7 to 4.7 in. All sizes will be available in ½, ⅝ and ¾ in. bores. The ½-in. bore sheave is provided with set screw only and the ⅝ and ¾-in. bore sheaves have both keyway and set screws. A positive locking device is provided to insure firm fastening to the shaft.

Floating Tool Holder

THE Tool-flex neoprene-mounted pull-out type floating tool holder is announced by *Burg Tool Mfg. Co.*, 5028 W. Jefferson Blvd., Los Angeles 16, as increasing efficiency of tapping on screw machines. Neoprene mounting is said to prevent binding, absorb shock, keep taps on center, and permit them to follow the drilled holes, assuring accurate threads from one piece to the next. The pull-out action of the holder is claimed to compensate for differences in cam motion and tap travel when backing out, preventing torn threads and broken taps. Holders are made of alloy steel, heat treated and ground. The short overhand on smaller models of the holder is said to facilitate use in small clearance machines.

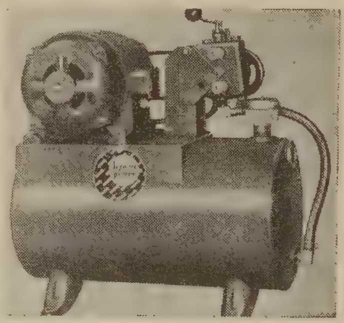


Electric Hoists

DESIGNATED the Whippet, a line of electric hoists have been put on the market by *American Chain & Cable Co., Inc.*, York, Pa.; capacities range from 250 to 2000 lb. The hoists are available with trolleys, either parallel or cross mounted, and can be furnished with hook suspension or for rigid bolt suspension. Standard lift of this wire rope hoist is 12 ft. Features include preformed wire rope with grooved drums, pull chain and handle for pulling loaded or unloaded hoists along runway beams, and push button control.

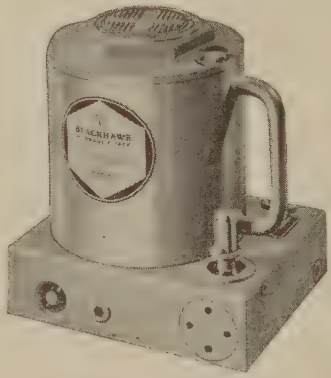
Hydraulic Power Unit

A PORTABLE hydraulic power unit designed to supply 3 gpm at 1000 psi has been announced by *Hydro-Power, Inc.*, Springfield, Ohio. Called the Paul Bunyan, Jr., the unit is recommended for the operation of equipment such as hydraulic wheel pullers, shaft extractors, portable elevators, arbor presses, broaching tools, pipe benders, lifting jacks, chip balers, vises and clamping tools. In an integral structure it includes a 17-gal storage tank, an electric motor, V-belt connected gear pump, and 4-way operating valve. Weighing 290 lb when supplied with operating oil, the assembly occupies a space of 16⅛ in. wide x 28 in. long x 29 in. high. Normally supplied with a 1½ hp, 1800 rpm, 220 or 440-v motor, the unit can be used with a 2½ hp, 1200 rpm, air-cooled gasoline engine for outdoor use.



Heavy Duty Jacks

TWO heavy duty hydraulic jacks, the 30-ton FB-11 and the 50-ton GB-11, have been announced by *Blackhawk Mfg. Co.*, Milwaukee 1. These hydraulic jacks combine the load pump and speed pump into one unit. The load pump cuts in automatically when the speed pump has raised the saddle to the load. These new models have bases machined from steel blocks 2¾ in. thick to withstand extreme stress. Other features include a recessed safety release valve, overall closed-construction, ports for gage or valve installation, pump beam protection, carrying handle, and on-the-side operation. The FB-11 and GB-11 are one-man operated.



Tap Grinding Fixture

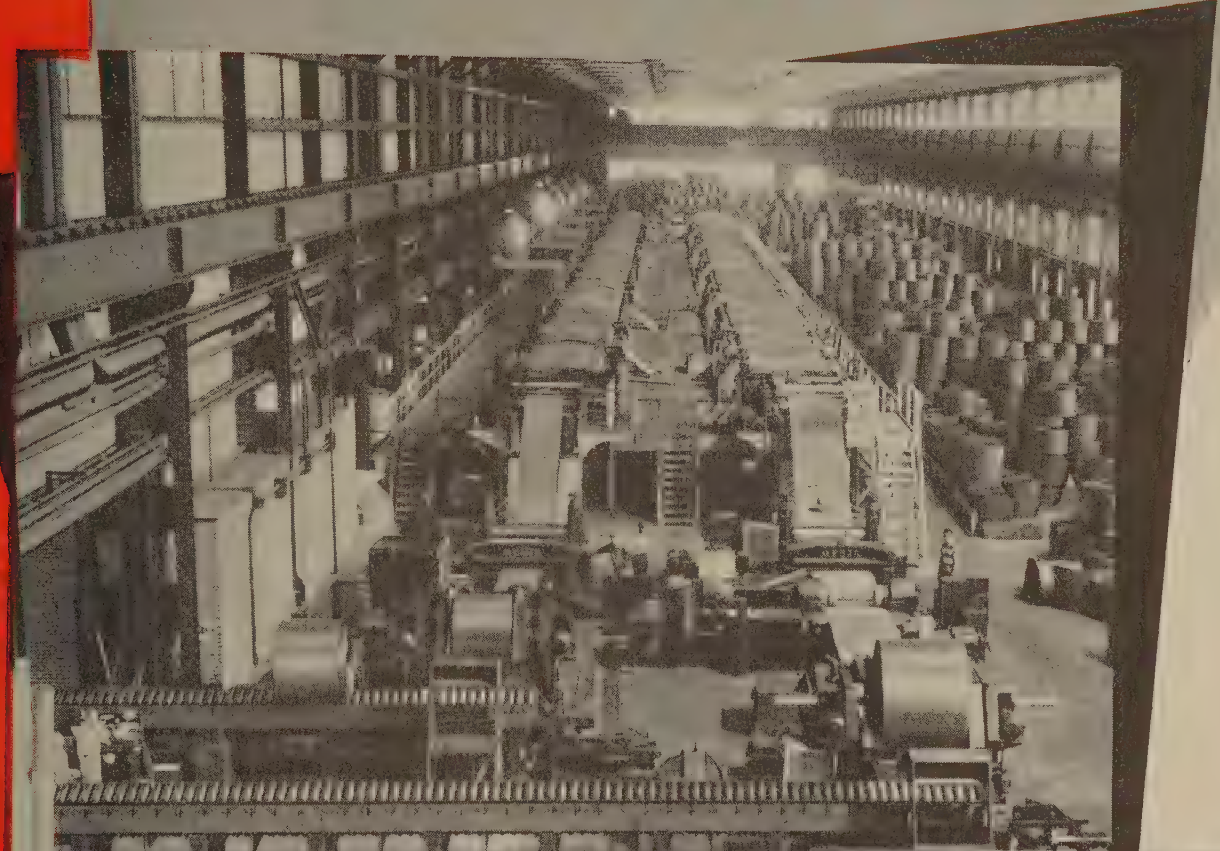
FOR grinding taps from No. 8 to ⅝ in., with 2 to 6 flutes, right or left hand, a fixture which mounts the tap between centers on a cutter grinder or in a lathe equipped with a tool-post grinder, has been developed by *Wick Co.*, 114 Elm St., Meriden, Conn. The fixture produces relief or back-off at the cutting portion of the flutes by eccentric action. The fixture head is mounted on a sealed permanently-lubricated ball bearing on a taper shank that mounts to face the head center which is carried on a swivel plate on the head face. An adjustable arm is attached to the head by a threaded hole marked to correspond with the number of flutes. This arm positions a locating pin that engages the tap between flutes for taps having more than two flutes. The grinding is accomplished by advancing the work to the wheel and by rocking the head while holding to the free end of the locating pin.

Roller Gravity Conveyer

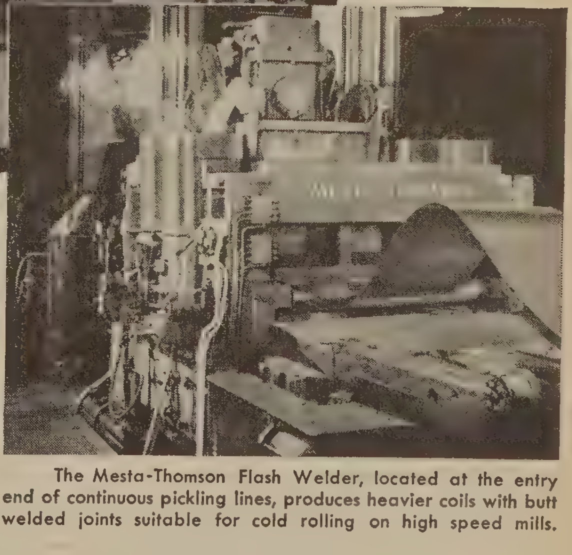
DEVELOPMENT of a two-in-one portable roller gravity conveyer, the rollers on one side of which are set high above the side rails, allowing the handling of any packages or parts that are wider than the frame, while the other side has the rollers sunk below the level of the side rails, permitting conveying items as wide as the distance between the two rails, has been announced by *Island Equipment Corp.*, 101 Park Ave., New York 17. These conveyers can be turned over for the type of work to be handled. With the rollers in high position, cartons and cases up to 24 in. can be carried; in low position, cartons, cases, rolls of paper, kegs, etc., can be carried. Legs are supplied in double post type, with adjustable height units varying from 12 to 72 in. Sections are 10 ft long, 90° curves, widths inside frame 14¾ or 16¾ in.

Continuous Pickling Lines

built by MESTA



A Mesta Continuous Pickling Line delivers greater tonnage of strip steel. This is due not only to the design and sturdiness of the individual units, but also to correct engineering of the entire process.



The Mesta-Thomson Flash Welder, located at the entry end of continuous pickling lines, produces heavier coils with butt welded joints suitable for cold rolling on high speed mills.

DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

MESTA MACHINE COMPANY • PITTSBURGH, PA.

Assembly Line . . .

WALTER G. PATTON

• New "Transfer-matic" machine produces 150 rear axle housings per hour . . . Dodge introduces postwar truck models . . . Ford opens assembly plant at Hapeville, Ga.

DETROIT — The increasing use of specialized machine tools of the transfer type is exemplified by the new "Transfer-matic" developed by The Cross Co., Detroit, which is capable of producing 150 rear axle housings per hour. This new equipment, embodying many new features for obtaining high speed operations with minimum manhours, is being installed in the plant of one of Detroit's major auto producers.

The Cross unit is 33 ft long and 24 ft wide and has five 2-station double-end machines in combination with a unique transfer mechanism. Individual operations include a rough and finished boring of wheel bearing seats, turning the outside diameter of the end flanges, turning the bolt clearance behind the end flanges and rough straddle facing and finished facing of the end flange.

Included in the automatic cycle are the parts pickup, location of the part, clamping and machining. In all, 20 parts are transferred simultaneously. Coolant chips are handled through a centralized system located beneath the floor. An idle station is provided between each of the machines for accessibility and to allow for removal of parts between operations if desired. Carbide tools, hydraulic feeds and hardened and ground steel ways are employed throughout.

The Cross Co. has developed its Transfer-matic for railroad car axles, heavy duty truck axle housings and cylinder blocks. It is also reported that Cross has under development plans for units that will handle transmissions, manifolds and similar parts requiring large scale production at low unit cost.

All stations on the new Cross machine operate simultaneously. After each completed operation, parts are transferred simultaneously to the next station. Complete control of the operation is possible through the use of a complex setup of electrical wiring and relays. Ten motors rated at 15 hp each are used for the main drive. In addition, there are other motors required for the hydraulic system. A total of 44 hydraulic cylinders actuate the various operations. The machine has 32 cutter heads.

DODGE has announced its first completely new truck in the past 10 years. The new "job-rated" trucks are completely redesigned, reengineered and rebuilt. In addition to emphasizing driver comfort and safety, the new models provide a greater number of chassis to truck buyers. New engineering features include improved weight distribution, a substantial reduction in wheelbase and the introduction of cross steering that permits 37° turning angle to both right and left.

The wheelbase for the conventional models up to 2 tons has been reduced 8 in., while the 2½ to 3 ton models have been reduced 6 in. Cab-to-axle dimensions remain unchanged, making it possible to use the same bodies as before. According to Dodge officials, the substantial increase to 248 in the number of standard models will enable the company to offer improved service to truck users. All Dodge trucks are sold on the "job-rated" basis.

The new Dodge cross steering has the drag link running parallel with the front axle. Drivers can now park or back into alleys or up the loading platforms with greater ease, according to Dodge engineers. This feature will be included in all models.

In keeping with a trend in the industry to improve the lot of truck drivers, Dodge has increased the seat width to 57¼ in. Greater leg support has been provided and seats can be adjusted to 7 in. The seat cushion utilizes air in combination with coil springs to provide optimum comfort for the driver. A hand control permits the driver to adjust cushion buoyancy to his weight or to meet road conditions.

An all-weather heating and ventilating system is provided, including truck heater, defroster vents, vent windows, cowl ventilator and a fresh air intake.

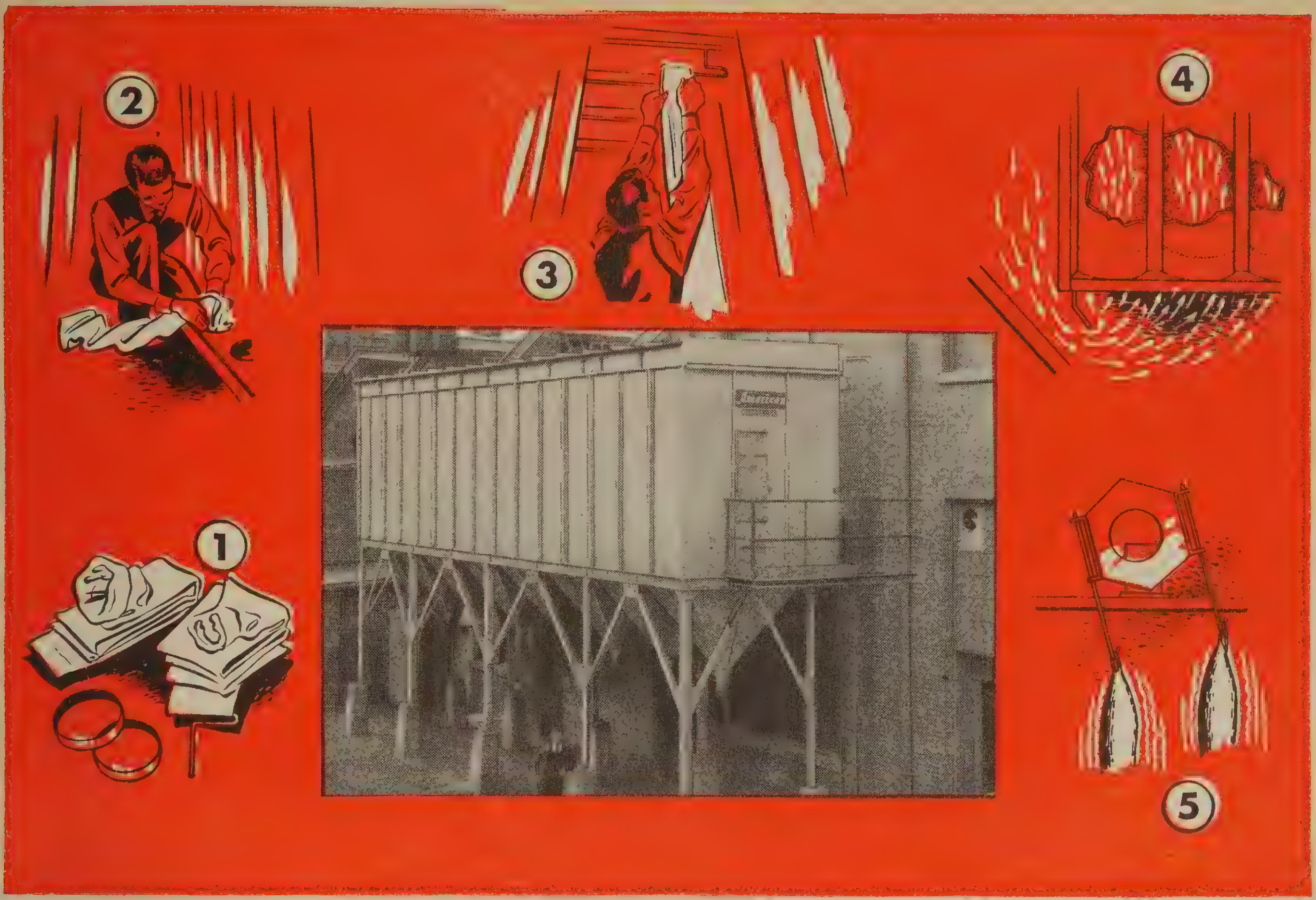
There is increased glass area and rear quarter windows have been added to improve visibility. Dodge's new "pilot-house" cabs are higher and wider. The standard cab is one-piece all-steel welded construction and is substantially roomier than the earlier models.

New and larger brakes have been specified. Front and rear axles have increased load-carrying capacity. Front springs are longer and the radiator core has been redesigned to give greater cooling capacity.

ACCORDING to Dodge engineers the new models will turn either right or left in 38 to 44 ft. The old 2-ton models would turn right in 45 ft and turn left in 48 ft.

The steering wheel and gear shift lever have been reengineered to give greater ease of operation.

The new bodies are wider and deeper and provide more loading space. However, with the shortening of the wheelbase and an increase in width and total glass area, gross weight of the new models will be about the same as their predecessors. This would indicate that the total amount of steel required for these trucks may be somewhat smaller than the previous models. A wider running



Dustube keeps both your dust and your expenses under control

Certainly — dust is wasteful, dust is a breeder of high costs, dust is the enemy of efficiency. But — SO ARE HIGH MAINTENANCES AND OPERATING EXPENSES! So when it comes to buying dust collection equipment, be sure you get a machine that not only DOES ITS JOB WITH HIGH EFFICIENCY, but can be installed and operated at a MINIMUM of COST!

Such a machine is the American Dustube which gives *peak* performance (efficiency by weight; 98% and more) along with operation and maintenance that are consistently *low-cost.*

This means *more* than a method to rid your plant of dust. It means a machine carefully engineered to do a superb task of dust-removal, PLUS keeping your expenses down at all maintenance-points. it means cost-cutting economy of original installation. It means equal cost-cutting in the simplicity of daily operation. It *means a machine made to save you money.*

① Tubes are compact, light, easy to store, economical to ship; they are never under tension . . . never in contact with metal which may abrade or corrode the fabric.

② DUSTUBES are readily accessible from a central walkway. The economy of maintaining them is emphasized by the fact that ONE MAN only is required for quick, clean inspection or replacement. No Tools are needed.

③ Tubes are easily and quickly inserted or removed. Their condition can be seen at a glance. Only very fine float dust reaches these tubes, NEVER coarse cloth-wearing particles.

④ Extra-fine dusts (silica dust and others) are trapped with nearly 100% efficiency by weight. Discharged air shows less than 10 million particles per cubic foot from 2 to 10 microns in size.

⑤ Dust is completely removed from the filter tubes, which are shaken like a rug while deflated and limp. Result: lower operating resistance, longer cloth life, a direct saving in horsepower.

American DUSTUBE
DUST COLLECTORS

Write for Catalog 72
Containing valuable ventilation data, this 54-page illustrated book shows the full line of Dustube dust-collection equipment. It is yours on request.

American
WHEELABRATOR & EQUIPMENT CORP.
(FORMERLY AMERICAN FOUNDRY EQUIPMENT CO.)
510 S. Byrkit St. Mishawaka 3, Indiana

dustube
DUST COLLECTORS

A 2-WAY OFFER

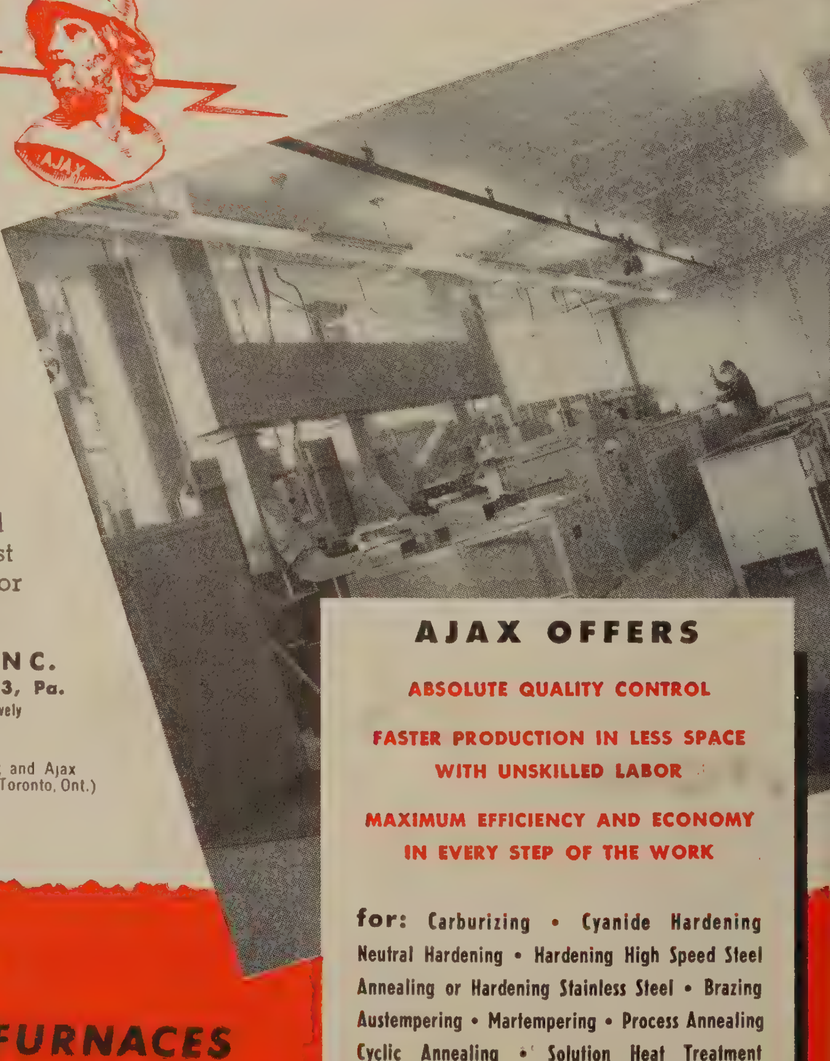
to those who have not yet fully investigated the amazing

SALT BATH HEAT TREATMENT PROGRESS OF THE PAST 5 YEARS

AJAX
ELECTRIC
SALT BATH
FURNACES

1 Write today on your company letterhead for a free copy of the 72-page Ajax data booklet "Electric Salt Bath Furnaces." Here you will find the complete, fully-authenticated story of exactly how and why these famous furnaces surpass any other type of heat treating equipment in quality, speed, and economy, in *4 cases out of 5.* And you will also find a wealth of heat-treating data that may go far toward putting this phase of your production on a sounder basis.

2 Choose your furnaces on the basis of actual proof, not on mere claims. Send—or bring—a specimen batch of your work for treatment in the full-commerical scale Ajax Metallurgical Service Laboratory. Learn exactly what you can expect from this method in specific terms of improved physical properties, faster production, less floor space, lower labor costs, reduced maintenance and greater efficiency all along the line. There is not the slightest cost or obligation on your part. Write or wire today.



AJAX ELECTRIC COMPANY, INC.
Frankford and Delaware Aves. • Philadelphia 23, Pa.
The World's Largest Manufacturer of Electric Heat Treating Furnaces Exclusively

AFFILIATED COMPANIES:
Ajax Metal Co.; Ajax Electric Furnace Corp.; Ajax Engineering Corp.; and Ajax Electrothermic Corp. (IN CANADA: Canadian General Electric Co. Ltd., Toronto, Ont.)

AJAX
HULTGREN

ELECTRIC SALT BATH FURNACES

More Dependable . . . More Economical
On 4 Applications out of 5

AJAX OFFERS

ABSOLUTE QUALITY CONTROL

FASTER PRODUCTION IN LESS SPACE WITH UNSKILLED LABOR

MAXIMUM EFFICIENCY AND ECONOMY IN EVERY STEP OF THE WORK

for: Carburizing • Cyanide Hardening
Neutral Hardening • Hardening High Speed Steel
Annealing or Hardening Stainless Steel • Brazing
Austempering • Martempering • Process Annealing
Cyclic Annealing • Solution Heat Treatment
Tempering • Descaling • Cleaning • Desanding

board has been added to facilitate loading.

Other features of the new Dodge models include deep, channel-section front bumpers mounted directly to the frame with new gusset-type reinforcements. The new design is said to eliminate hooking of bumpers in close quarters.

Dual cylinder rear wheel brakes are standard on the ½ and ¾ ton models. Wide base rims for tires are specified for all models.

Rear doors of panel trucks are 45¾ in. high, supported by wide pillars and heavy hinges. Solid steel roofs are used on panel trucks. Rear fenders on pickups are of a new design and running boards of these models are substantially wider than earlier designs.

The new Dodge "air-o-ride" seats are controlled by coil springs plus a cushion of air. The amount of air is regulated by a lever at the bottom of the center of the front seat.

The new "chair height" seats have an adjustment of 4 in. forward and backward and a pin-and-socket arrangement offers a 3-position back adjustment.

* * *

OPENING of the new Ford assembly plant at Hapeville, Ga., offers an additional opportunity to study trends in automobile plant layouts. Four and one-half miles of overhead conveyers are used in the new assembly plant. There are 1¼ miles of various floor-type conveyers.

All spray booths are of the latest down-draft type which cost an average of $60,000 each. Washed, filtered and tempered air is supplied to the operators in each booth who are no longer required to wear perspiratory protection.

Engineers have redesigned the bonderizing system so as to insure better cleaning of the bodies-in-white as well as provide a metal coating that insures a better bond between the paint and the metal.

All structures are one-story, steel framework buildings, with steel sash and brick, gunite and limestone walls. Fluorescent lighting is used in both plant and office. A test track will adjoin the plant.

It is estimated the new Georgia unit will employ 2000 workers when full production is attained. Henry C. Dorsey will be plant manager and R. J. Burke will remain district manager. Estimated cost of the new branch assembly plant is $7 million.

The Hapeville plant will assemble Ford cars and trucks for Georgia, Florida, Alabama and part of Tennessee.

Other new Ford assembly plants are located in St. Louis, Los Angeles and Metuchen, N. J.

SLATED FOR SOVIET: *Congressional investigators have discovered more than $17 million of equipment earmarked for shipment to the Soviet stored in War Assets Administration warehouses. Upper view shows 35 carloads of electrical equipment and mine locomotives found crated and tagged for Russia at WAA's Marion, O., depot. Lower photo shows electrical mine hoist equipment stored in the WAA warehouse at Warren, O., awaiting shipment to Russia.*

Midland Puts Mammoth Automobile Press Into Service at Cleveland

Cleveland

• • • A 400-in. press, each stroke of which can blank and form a complete side rail for the steel frames of the largest busses, trucks and trailers on the highways, went into service Dec. 9 at the Cleveland plant of Midland Steel Products Co.

President E. J. Kulas said it was the second of three such presses, costing a quarter million dollars apiece, to be acquired by Midland.

"The first already is operating in our Detroit plant, with another yet to be installed there," he said.

Made by Clearing, they are the largest mechancial presses ever built for automotive parts manufacture. Weighing 1.1 million lb, they have a 3000-ton capacity and operate at eight strokes a minute.

"A new plant addition of about 37,000 sq ft houses the new press at our Cleveland works," Mr. Kulas stated. "The extra space provides for parts storage along our assembly line so that more efficient change-overs can be made in feeder lines to accommodate model specifications as they are received from automotive manufacturers."

"Because side rails for frames of such size now can be handled for the first time in one pass, instead of in two or more, a part of Midland's total press capacity can be devoted to faster handling of our growing volume of automotive orders," Kulas added.

The new presses are 43 ft 10 in. above the base, which is set into a concrete floor well some 15 ft deep.

Washington . . .

EUGENE J. HARDY

• Congress studies cost, difficulties of restoring Merchant Marine . . . Proposed program would require some 3,500,000 tons of steel. "Modest" start calls for 200,000 tons.

WASHINGTON—Congress is now weighing the probable impact upon the national economy of a shipbuilding program such as has been proposed by the White House's Committee on the Merchant Marine. The report recognizes the fact that the government must bear part of the expense of such a program and makes specific recommendations, including the proposal that the government start now and underwrite up to half the cost of a 4-year, $600 million initial shipbuilding program.

This 4-year program would include construction of two superliners of 50,000 tons each and building of 44 other vessels ranging upward from 6000 tons for coastal ships to ocean liners up to 24,000 deadweight tons. However, this would be but a start on the long range program suggested which looks to an ultimate fleet comprised of more than 1000 fast liners totaling approximately 11,500,000 deadweight tons.

The committee has outlined what it calls a "modest start" for the remainder of the present fiscal year and for 1948—largely because Congress has appropriated only $99 million for 1947 fiscal year, of which $15 million is earmarked for betterment of existing ships.

For 1948, the committee recommends that eight hulls be laid down for passenger ships with a total tonnage of 130,000 deadweight tons. In 1949, it proposes ten ships aggregating 180,000 tons, including one superliner of 50,000 tons. In 1950, the program calls for 13 ships aggregating 175,000 tons and in 1951, it is proposed to lay down 15 hulls for a total tonnage of 200,000 tons, including the second superliner.

Several factors must be faced by the legislators in considering the report of the committee. One is the urgency and importance of maintaining present American position on the high seas. Another is the probable cost to the government at a time when there are strong pressures for reduced taxes and government expenditures. Still another is how the shipbuilding program is to be carried out and, finally—and perhaps the most complicated—is how the necessary steel and lumber, both highly critical items, are to be channeled to this end.

The long range program would require more than 3,500,000 tons of steel, according to unofficial Maritime Commission estimates. Nearly 900,000 tons of this total would be in the form of plate. This is of little concern since it covers a period of years.

On the other hand, the initial 4-year program is estimated to require something more than 200,000 tons of steel, about a fourth in plate. This would be required in the following amounts: 40,000 tons in 1948, about 58,000 tons in 1949, about 54,000 tons in 1950, and about 62,000 tons in 1951.

While these are relatively small amounts in relation to total steel production, legislators familiar with steel production and supply wonder how even this small amount could be squeezed from the quotas of other steel consumers who are unable to get enough for their current needs. It is no help at all to be told by the industry that demand and supply will not balance for perhaps another 2 years. A demand for export steel under the Marshall Plan only complicates matters even more.

A question of somewhat lesser importance is how and where the ships are to be built. Maritime Commission sources say that the agency at present does not have facilities with which to embark upon such a program and that the obvious procedure is to let our private contracts through competitive bidding. As for the two superliners, the only facilities capable of undertaking the work are the Navy Yards at Newport News and Quincy.

The President's Committee was well aware of these problems and many others, some of which have existed in recurring forms since the war between the states. So far, the report admits, some of these have "defied permanent solution despite repeated attempts on the part of the government."

Historically, since 1865 the American commercial fleets have operated under difficulties which, at times, virtually removed the American flag from the seas. Most of this trouble stems from high operating costs. Replacement and maintenance costs have arisen progressively; pay and working conditions of the merchant seamen have improved in recent years. Adding to the cost is continued use of cargo handling methods outmoded 50 years ago such as moving cargo into and out of holds with booms and winches, involving many handlings of individual items.

While some American flag operations have been carried on successfully without government subsidy, these have been in a minority. For the most part, government aid of various types has been necessary in order to keep American shipping on a fair and competitive basis with foreign trade routes.

The committee fears a recurrence of the situation following World War I. At that time, American bottoms carried 51 pct of the water-borne foreign commerce. By 1933, however, the percentage had dropped to about 33 pct and had

JOB PROVED
SUNICUT
with
PETROFAC*

Faster Cutting, Longer Tool-Life, Reported for the New Sun Cutting Fluids Containing No Animal or Vegetable Fatty Oils

Since Sun recently announced the new grades of Sunicut with Petrofac, favorable performance reports have been coming in on practically every kind of metal-cutting job.

Higher cutting speeds, longer tool-life, increased production, better finish, performance superior to that of any cutting oils previously used . . . these are the "Job Proved" results that are constantly being reported.

"10% increase in tool-life on our automatics" . . . "chaser-life increased 50% on pipe-threading machines" . . . "finer finishes" . . . "best cutting oil I have ever used" . . . say typical reports from our customers.

No animal or vegetable fatty oils go into the new Sunicut grades. The Petrofac used in compounding is entirely derived from petroleum. The new Sunicut Cutting Oils with Petrofac possess superior metal-wetting and anti-welding properties, as well as unusual extreme-pressure characteristics.

Sunicut with Petrofac will not turn rancid. It is available in plentiful supplies and at reasonable, stable prices. Call in your Sun Cutting Oil Engineer for full information, or write Department IA-12.

SUN OIL COMPANY
PHILADELPHIA 3, PA.
"Makers of the well-known Sunoco Emulsifying Cutting Oil"
In Canada: Sun Oil Company, Ltd.—Toronto and Montreal

SUN INDUSTRIAL PRODUCTS

SUNOCO

*Petrofac is a trade-mark of Sun Oil Company reached a new low of 22 pct by 1939.

A congressional investigation in 1933-34 brought to light many shortcomings in the 1928 Shipping Act which permitted abuses of mail contract subsidies. One of the results of the extended hearings, culminating in the Act of 1936, was cancellation of the mail contracts and authorization of open and above board subsidies. However, shipbuilding still lagged.

During the period between 1939 and 1946, more than 5600 vessels were constructed. Most of these, however, are held unsuitable for peacetime competition against fast and more modern foreign ships although some of the war-built tankers and bulk-cargo ships are apparently operating profitably under private ownership.

Disposal of the wartime fleet was authorized in the Ship Sales Act of 1946. It directed that sales be made on a fixed price basis to both United States citizens and aliens until Dec. 31, 1947. As of July 1, 1947, a total of 1105 ships had passed into private hands—306 to Americans and 799 to foreign owners.

Charter was permitted American shippers (but not foreign) but the government deliberately fixed high charter rates in order to boost purchasing. In the meantime, the closing date has been extended to Mar. 1, 1948; on that date, ships remaining on hand are to be laid up for the reserve fleet.

The committee has recommended as a start for the proposed merchant marine program that an additional number of smaller ships, of the Liberty and Victory types (of less than 6000 tons), say about 250 vessels, be held out of the proposed reserve and offered for sale through competitive bidding by domestic shippers.

Back of the committee's recommendations is a fear that unless something is done immediately, foreign nations will again get too much of a head start on the United States in water-borne shipping. The Commerce Dept. has estimated that by 1950, the volume of water-borne imports to the United States will be around 60 million tons, including 30 million tons of petroleum products; at the same time, Commerce figures, dry cargo exports from the United States would be better than 30 million tons, not counting an undetermined amount of coal. Commerce Secretary Harriman has voiced the opinion that department estimates are conservative, if anything.

In order to get under the wire for this expected freight business, foreign shipyards are heavily engaged in laying bottoms for postwar fleets of new, modern and efficient ships. It was revealed in the Paris Report that some nations are relying heavily upon the Marshall Plan to aid their shipbuilding programs.

Admitting that subsidization will be necessary for both construction and operation of American shipping, the committee report declares that a solution must be found. It is convinced that a "modern, efficient merchant fleet and an effective, progressive shipbuilding industry are necessary to the peacetime economy of the United States." The committee report then falls back upon its most dependable argument—national security.

"The committee faces the inevitable conclusion," the report stated, "that such a merchant fleet and shipbuilding industry are indispensable to national security and would have to be maintained, even though there should be no other benefits accruing . . . It will be a matter of national concern if the number of men employed in shipyards should drop below 60,000."

It is on this basis that amendment of the Act of 1936 is recommended and that shipbuilding be prosecuted more vigorously.

THE BULL OF THE WOODS BY J. R. WILLIAMS

ONLY A BIG SHOT CAN GET SUCH SERVICE-- THEM OTHER BOSSES WILL HAVE A TOUGH TIME KEEPIN' UP WIT' THE OL' BOY!
'MINDS ME OF A FAMOUS CAVALRY OFFICER--HE ALWAYS HAD TWO FRESH RACE HORSES AND HE WONDERED WHY THE BOYS ON ONE GOVERNMENT ISSUE PLUG COULDN'T KEEP UP WITH HIM!
12-26
J.R.WILLIAMS
A FRESH HORSE
T. M. REG. U. S. PAT. OFF.
COPR. 1947 BY NEA SERVICE, INC.

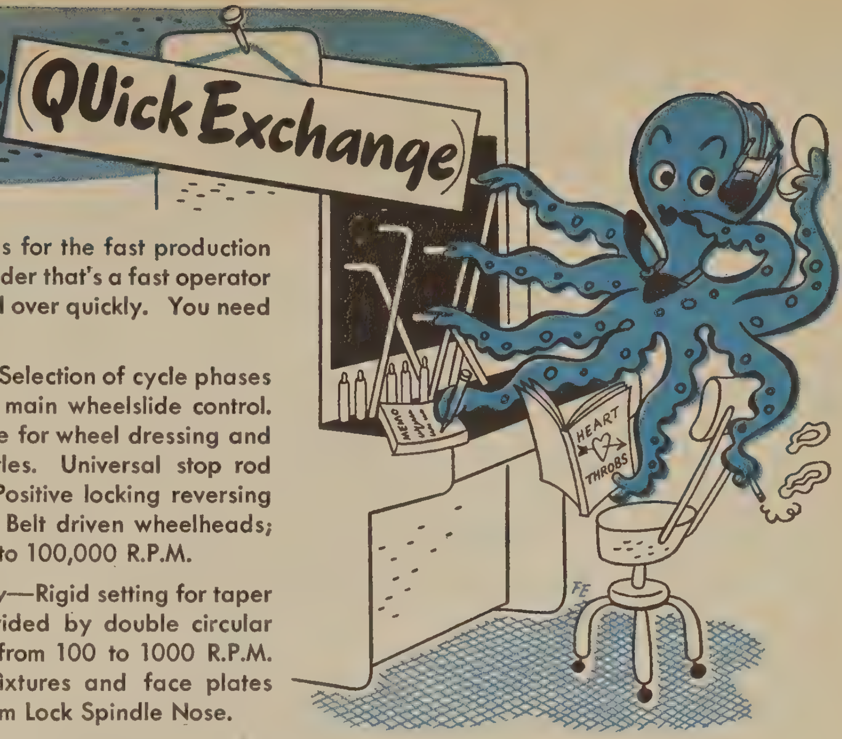
Old Mining Machinery Scrap Is Coming In

Washington

• • • **Interior Dept.** reported last week that the nation's mining industry had responded to Secretary Krug's appeal for collection of scrap mining machinery with "whole-hearted support."

Mr. Krug said the industry was "virtually unanimous" in acknowledging the need for increased scrap supplies. He warned that heavy domestic and foreign steel requirements emphasize the importance of scrap conservation and said that failure on the part of any industrial group to meet its scrap quotas may "jeopardize the vital steel-production program."

fast operator.. (QUick Exchange)



WHEN the tool room is flooded with calls for the fast production of odd lots of work, you need an internal grinder that's a fast operator—one that can be set up easily and changed over quickly. You need a Bryant No. 112 Internal Grinder.

Quickly adjusted cycle controls for wheelslide—Selection of cycle phases either manually or automatically through main wheelslide control. Independent setting of wheelslide traverse for wheel dressing and grinding by two convenient hand throttles. Universal stop rod positions wheelslide for face grinding. Positive locking reversing dogs for setting grinding stroke quickly. Belt driven wheelheads; Hi-Frequency wheelheads for speeds up to 100,000 R.P.M.

Work spindle designed for operating efficiency—Rigid setting for taper grinding up to 90° included angle, provided by double circular slide mounting. Infinite spindle speeds from 100 to 1000 R.P.M. Quick interchange of chucks, holding fixtures and face plates provided by American Standard Type Cam Lock Spindle Nose.

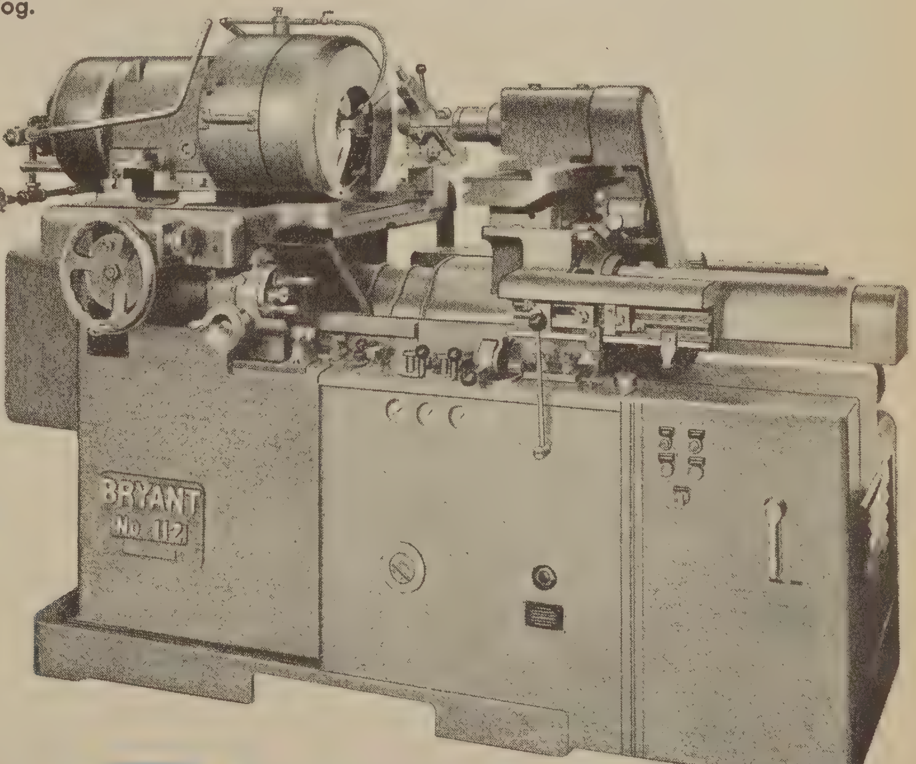
Three cross-feed controls for versatility—Fast set-up provided by rapid traverse cross-feed. Increased output on long runs with power cross-feed control. Accurate size control through precision feed dial. These are the highlights that make set-up of the 112 simple and change-over fast. When combined with the basic features available in all Bryant grinders, they add up to less down time, more accurate work, finer work finish and faster production.

For more details on a fast operator that can handle more calls per day, just ask for the Bryant No. 112 catalog.

No. 112

HYDRAULIC

INTERNAL GRINDER



Send for the Man from

BRYANT CHUCKING GRINDER CO.

SPRINGFIELD, VERMONT, U. S. A.

BRYANT

West Coast . . .

ROBERT T. REINHARDT

• Dismal future for shipbuilding in the West seen by Bethlehem official . . . Aircraft companies likewise face serious long-range problems.

SAN FRANCISCO — Shipbuilding in the United States as a whole, and on the West Coast particularly, faces a bleak and dismal future, according to W. M. Laughton, general manager, Bethlehem-Alameda-Shipyard, Inc.

In an interview aboard the *S. S. President Cleveland* on its trial run earlier this month, this veteran of almost a quarter century of service with Bethlehem Steel Co. and its various subsidiaries, pointed out that unless the Federal government suddenly became conscious of the importance of a merchant marine fleet and appropriated approximately $200 million a year for construction of ships, our country would soon be outstripped by foreign powers. He pointed out that ships for registration in European countries could be built much cheaper there because of lower labor costs and more lenient regulations pertaining to health measures and safety.

"Even the *Normandie* which was considered a super deluxe ship, would not have been accepted for registration in this country," he said.

According to Mr. Laughton, in a recent report made by former President Herbert Hoover, 162 committees have been appointed to investigate the American Merchant Marine, and thus far voluminous reports are the only result.

The only demand for ship construction today apparently is for the tankers so badly needed by foreign countries. Even this backlog is expected to be quickly absorbed and the shipways of the United States will be bare. In discussing the position of the West Coast as a shipbuilding center, Mr. Laughton pointed out that this area is penalized by a labor cost higher than in the East. The differential is reported as being approximately $1.50 per hr for a skilled shipbuilder in the East as against $1.53 per hr in the West. In repairs the differential is greater with a skilled mechanic in the East receiving approximately $1.50 per hr and in the West $1.67 per hr.

Since approximately 80 pct of the cost of ship construction is labor, this differential becomes important.

Mr. Laughton and T. C. Ingersoll, manager of BASI, stated that it was obvious that subsidies would have to be established to encourage the development of a healthy Merchant Marine fleet in this country but that such a fleet was essential as a defense measure. They pointed out that the government is already subsidizing agriculture to the extent of approximately $800 million per year and that similar large subsidies have been extended to other industries through the RFC and other governmental agencies.

The *S. S. President Cleveland,* which was launched June 24, 1946 at the Bethlehem-Alameda Shipyard in Alameda, Calif., was converted to a luxury liner by Bethlehem from a P-2 type transport of the admiral class. This 23,500 ton ship is one of 10 built by Bethlehem under contract with the U. S. Maritime Commission. Originally planned as troop ships, eight were completed to those specifications, and the other two were converted to passenger liners. The *S. S. Cleveland* is the first of these to be launched and its sister ship, the *President Wilson* is expected to be ready for its sea trials in May of 1948.

The *Cleveland's* hull is of combined riveted and welded construction with an overall length of 608 ft and beam of 75 ft, 6 in. The mid-ship houses above the boat deck, the stacks, the lifeboats and davits are all of riveted aluminum construction which saves about 75 tons in weight which, at this height, is important to the stability of the vessel.

UNIQUE cargo handling equipment is installed at the No. 4 hatch which permits cargo to be loaded and discharged through side openings with the ship's own gear. Called the "Siporter," the equipment consists of two retractable parallel booms, each carrying one trolley, which are installed for travel athwartship in unison. The two booms when working together can handle three long tons. A 10 hp motor operates the booms and a 15 hp motor controls the travel of the trolleys. A 50 hp motor operates the hoist drums.

It is reported that the advantage of the "Siporter" is that with its use top deck booms and winches are eliminated, thus leaving additional passenger space. The booms project sufficiently far from the side of the ship to land the center of the load approximately 16 ft from the ship side.

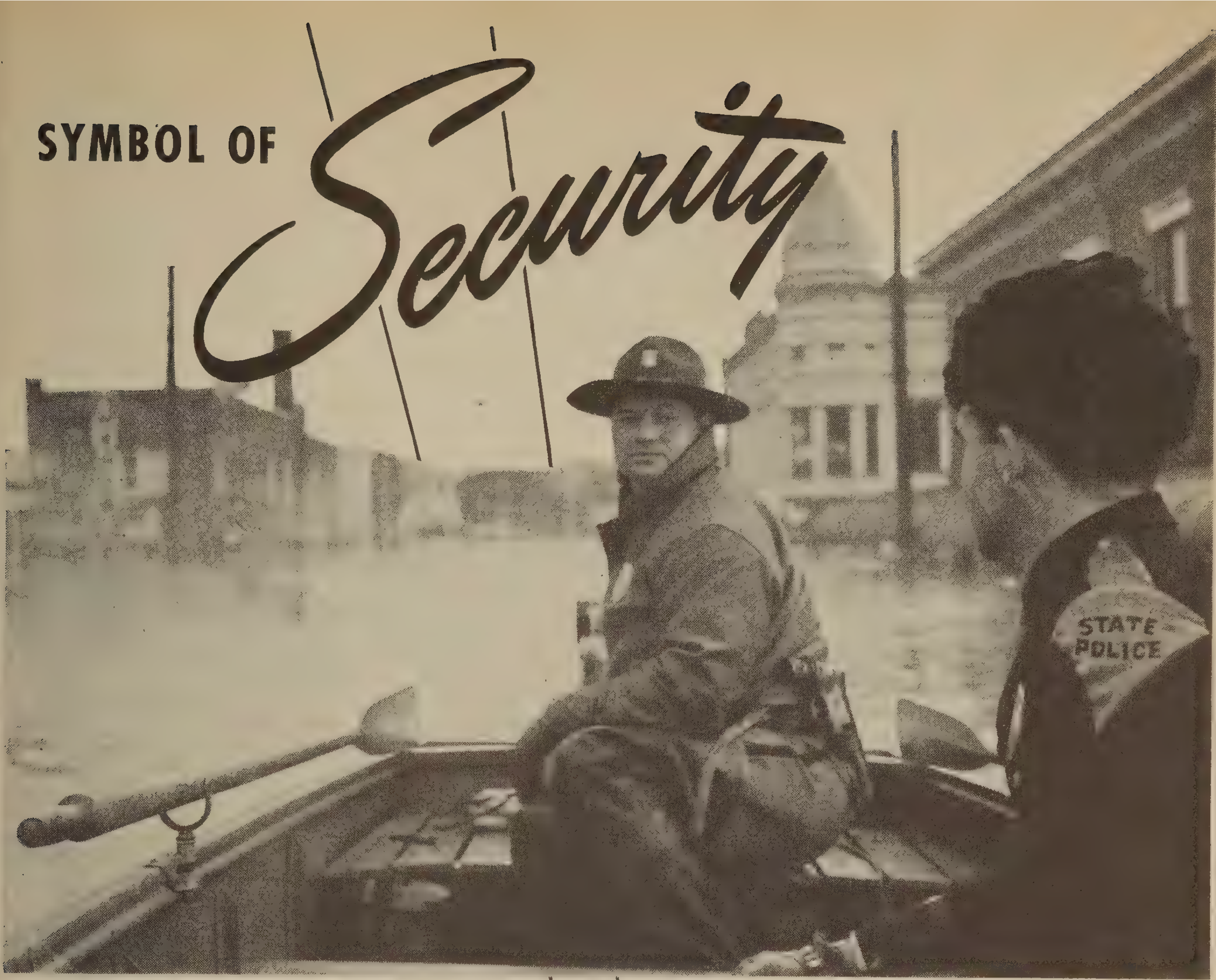
Because the ship was originally designed for wartime service, there are two engine rooms and complete power units. Each is equipped with two boilers generating steam for a turbo-generating set that has an output of 6890 kw at 3500 volts, 3 phase, 60 cycle at 3600 rpm and supplies this current to a synchronous propulsion motor normally rated 9000 shaft hp at 120 rpm and with a maximum capacity of 10,000 shaft hp at 124 rpm—3610 volts.

The ship's twin propellors are driven by the two synchronous motors which are capable of maintaining a 19 knot sea speed. The turbine-electric propulsion units were designed by General Electric Co.

According to Mr. Laughton, the ship has cost in excess of $19 million. This figure will be considerably higher than originally estimated because of higher labor costs and difficulties of obtaining materials which held up completion. Steel for the ships had been on hand for approximately two years, it is reported, but such minor items as small motors, specially heat treated glass and other fittings delayed delivery approximately 7 months beyond schedule.

The presently luxuriously out-

SYMBOL OF *Security*



TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES
REG. U.S. PAT. OFF.

Flood waters churn through the crumbling levee, imprison families in the upper floors of their homes. Life, property, law and order are in jeopardy. Down the street—in boats today—come the State Troopers. Symbols of Security, the Troopers arise to this emergency as to every other.

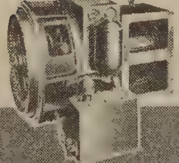
Another symbol of security—recognized in every field where the transmission of heavy-duty power is a critical problem—is the trade-mark of the Twin Disc Clutch Company. Men engaged in logging, construction, oil drilling, metal fabrication, agriculture and fishing have learned to have confidence in that part of their equipment which bears the familiar Twin Disc oval.

Twin Disc Friction Clutches, Marine Gears, Air-actuated Clutches and Hydraulic Drives give trouble-free performances. Applications specifically suited for your operation are possible because of the completeness of the Twin Disc line.

You may obtain the counsel of Twin Disc engineers by describing your power transmission problems in a letter to the TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).

Heavy Duty Clutch

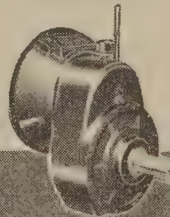
Hydraulic Torque Converter



Tractor Clutch

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES
REG. U.S. PAT. OFF.

Reduction Gear



Marine Gear

SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918 fitted vessel could be converted to its original purpose as a troop ship in a few weeks' time, according to Bethlehem officials if no attempt were made to salvage and save these fittings. However, normal time for conversion to a troop ship would be from 4 to 6 months, it was said.

The *S. S. Cleveland* will be operated by the American President Line and will carry a crew of 352 and approximately 550 passengers in trans-Pacific trade. The first voyage is scheduled for Dec. 27 and it is reported that that cruise and the succeeding one are booked solid.

LOS ANGELES—Postwar financial characteristics of the aircraft industry in the aggregate have been and are losses of record proportions, mounting costs, and a steady shrinking of working capital resources. These unfavorable trends have given rise to new capital needs, and at the same time they have discouraged and prevented new financing except for a few short-term credits, according to Ralph V. Hunt, vice-president comptroller, Douglas Aircraft Co., Inc.

From the financial viewpoint, the basic requirement of the industry is a larger, more sustained volume of production at competitive prices which permit reasonable margins of profit. Without this single but important element of profitable volume, it is difficult to visualize any alternative other than that the industry will continue along its path of financial retrenchment, attempts at diversification and makeshift devices in an effort, possibly a futile one in many cases, to stave off insolvency or bankruptcy. This is not a prospect suggesting strength in the air, Mr. Hunt said.

Summarizing the financial outlook of the country's aircraft industry, Mr. Hunt emphasized these facts about the industry:

(1) Large Postwar deficits—1945 operating income of $325 million for 15 aircraft companies replaced by $82 million 1946 operating deficit; further 1947 interim losses. Tax carrybacks greatly reduced losses in 1946, will offset to lesser extent in 1947; no tax carryback thereafter.

(2) Working Capital Depletion—Working capital of the 15 companies declined $80 million, nearly 13 pct during 1946. Operating losses, large property acquisitions, major contributing factors. Proportions of inventories, other non-cash items increased. Tax problems, 1947 drains on working funds bring companies nearer severe financial difficulties.

(3) Increasing Aircraft Costs—Labor, material, overhead costs more than double prewar levels. Aircraft costs increased more importantly by advances in technology, complicated character of postwar airplanes. Experimental development, tooling costs average 10 times prewar. Higher costs, causing depletion of wartime capital accumulations, give rise to increased need for new capital and profits.

(4) Need for Profitable Volume—Industry need not for volume orders only, but for orders on price basis to yield profit. Although competition certainly advised, uncontrolled competitive contract awards, promising succession of heavy losses, worse financially for industry than no contracts.

(5) Difficulties in Raising New Capital — Stronger companies have short-term bank credits, not available to certain other large and small units. Operating losses, working capital depletion, higher costs, other disappointments have lowered public investment opinion of industry. No new postwar equity or long-term financings have been offered; none appear likely in face of continuing deficits.

THE LONGEST LINE: *Shown leaving the A. O. Smith plant in Milwaukee is some of the 24-in. line pipe being shipped to Michigan Wisconsin Pipe Line Co. and Michigan Consolidated Gas, who will use it to build a line* 1300 *miles long—the longest line in the country. Present schedules call for final delivery of pipe early in* 1950.

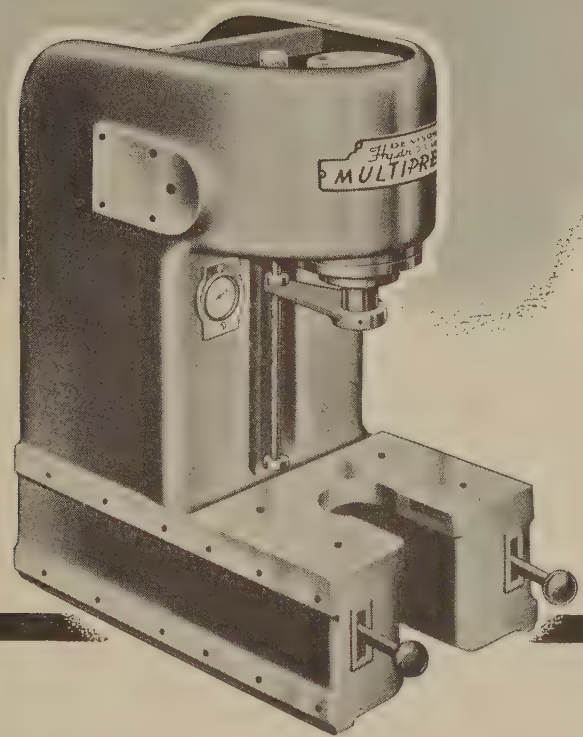
SALT LAKE CITY—Representatives of the Henry J. Kaiser interests, Portsmouth Steel Co. and the Kaiser-Frazer Co. have been going over the war surplus blast furnace at Ironton, Utah, during the past week, presumably for the purpose of revising upward the Portsmouth bid for the facility.

Portsmouth Steel, only bidder for the furnace, offered $300,000 but WAA turned this down as too low. The disposal agency has set a fair sale value on the property of about $1,150,000.

At the time the original bid was submitted, Portsmouth officials said they planned to operate the furnace at its present location to produce pig iron for the company's Ohio plant, in which Kaiser-Frazer has a substantial interest.

Final action on bids for the war surplus kalunite plant in Salt Lake City has been postponed by WAA to permit competitive bidders and their backers to argue some more with the disposal agency officials. American Potash & Chemical Corp., the high bidder, has already started an engineering survey of the plant to speed up conversion work if and when its $752,000 offer is accepted. Columbia Metals Co., the second high bidder, is continuing its fight to block disposal to American Potash.

MULTIPRESS *Versatility*
will boost your production



RAPID CHANGES from one operation to another with a minimum loss of operating time—you'll find this an important feature of Multipress adaptability. Using a special die-adapter on the Multipress ram, die change time can be reduced to *as little as five minutes!* Your production is never slowed up by prolonged "down time." From one high-speed job to another, Multipress flexibility makes retooling quick and easy.

Bench-size models in 4, 6 and 8 ton capacities, plus the new 75-ton floor model, offer a wide choice of manual and automatic controls of tonnage, speed and cycling—adaptable to almost any type of production job. Standard Multipress accessories include benches, side shelves, work-table extensions and a variety of bolster plates—plus accessory tooling for indexing, pelleting, foil-marking and other special operations.

Our new, colorful 28-page booklet, "Multipress, and How You Can Use It," is packed with on-the-job data and stories of Multipress accomplishments. It proves why many users call Multipress the modern production miracle.

The DENISON Engineering Co., 1158 Dublin Road, Columbus 16, Ohio

WRITE FOR YOUR FREE COPY TODAY!

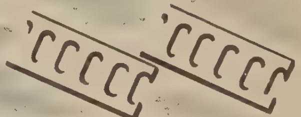
DENISON
EQUIPMENT for APPLIED
HydrOILics

HydrOILics
INDUSTRY'S RIGHT HAND

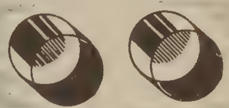
BLANKING

FORMING

STRAIGHTENING


PUNCHING

CRIMPING

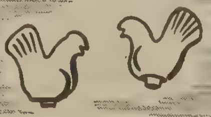

DRAWING

TRIMMING

PREFORMING

BROACHING

FOIL-MARKING


PELLETING

PERSONALS

• **A. J. F. MacQueen** has been appointed superintendent of electrical department at Algoma Steel Corp., Ltd., Sault Ste. Marie, Ont. He has formerly been with the General Electric Co., Sharon Steel Corp., Rotary Electric Steel and James Stewart Co. He went with Atlas Steel Ltd. in 1943 as superintendent of electrical and mechanical maintenance. **William O. Bishop** has been appointed technical assistant, blast furnaces, at Algoma Steel. He had been associated with Republic Steel Corp., E. J. Lavino & Co. and Phosphor Bronze Smelting Co. previously.

• **Thomas Oxnard,** president of the Savannah Sugar Refining Corp., and **John Morel,** Strachan Shipping Co. partner, have been elected directors of Southern States Iron Roofing Co. of Savannah, Ga.

• **W. A. Neumann, Jr.** has been appointed factory controller, assistant treasurer and assistant secretary of the De Laval Steam Turbine Co., Trenton, N. J., succeeding **C. J. Kushell, Jr.,** who has resigned. Prior to his association with De Laval a year ago, Mr. Neumann was with the Westinghouse Electric Corp.

• **E. T. Horsey** has been appointed director of sales, Cleveland Republic Tool Corp., Cleveland. He was formerly with Weatherhead Co. and Cleveland Hobbing Machine Co.

• **Harold W. Logan** has been appointed manager of sales for the steel division of International Harvester Co., Chicago, succeeding B. F. Courtright, who died Oct. 17. Mr. Logan began his service at the Wisconsin Steel Works in 1926 and in 1937 was promoted to contact metallurgist. In 1945 he became second assistant superintendent of the metallurgical and inspection department and recently he was transferred to the general office as sales representative.

• **Vance N. Wilson** has been appointed safety coordinator for the Pennsylvania Salt Mfg. Co., Philadelphia. Mr. Wilson joined Pennsalt in 1941 and enlisted in the Navy early in 1942. Upon his return to Pennsalt in 1946, he was named supervisor in charge of tank cars in the traffic department.

° ° °

• **Joshua L. Miner** has retired as vice-president, Lumnite Div., Universal Atlas Cement Co., U. S. Steel Corp. subsidiary, New York. **Frank E. Lobaugh,** who has been technical service director of the division for the past 3 years, has been appointed manager of the division. Mr. Miner joined the company in 1922 and in 1924 became identified with the subsidiary company. In 1937 he was elected director and vice-president of that company.

CHARLES H. STEWART, manager, Wilson-Snyder Mfg. Div., Oil Well Supply Co.

• **Charles H. Stewart** has been appointed manager of the Wilson-Snyder Mfg. Div., Oil Well Supply Co., U. S. Steel Corp. subsidiary. He succeeds **T. E. Regan,** who has resigned. Since 1940, Mr. Stewart has been shop superintendent at Wilson-Snyder.

• **George J. Parker** has been appointed sales manager of the New York Welding Supply Co., Inc., New York. Mr. Parker has been connected with the welding business since 1924. From 1924 to 1928 he was with the Commercial Acetylene Co. From 1938 to 1946 he served with the Air Reduction Sales Co., and recently, until his connection with the New York Welding Supply Co., was associated with Atlantic Oxygen Co.

• **Philip A. Snyder** has been appointed general sales manager and **Charles E. Horne,** general superintendent, of the new specialties division of the Yale & Towne Mfg. Co. which is to be located at Salem, Va. Mr. Snyder will continue his present duties as manager of the specialties sales for the Stamford Div. until the specialties division's plant is opened at Salem.

• **Charles F. Newpher,** executive vice-president and director of the National Screw & Mfg. Co. of Cleveland, has been elected to the directorate of the Lock Thread Corp., Detroit.

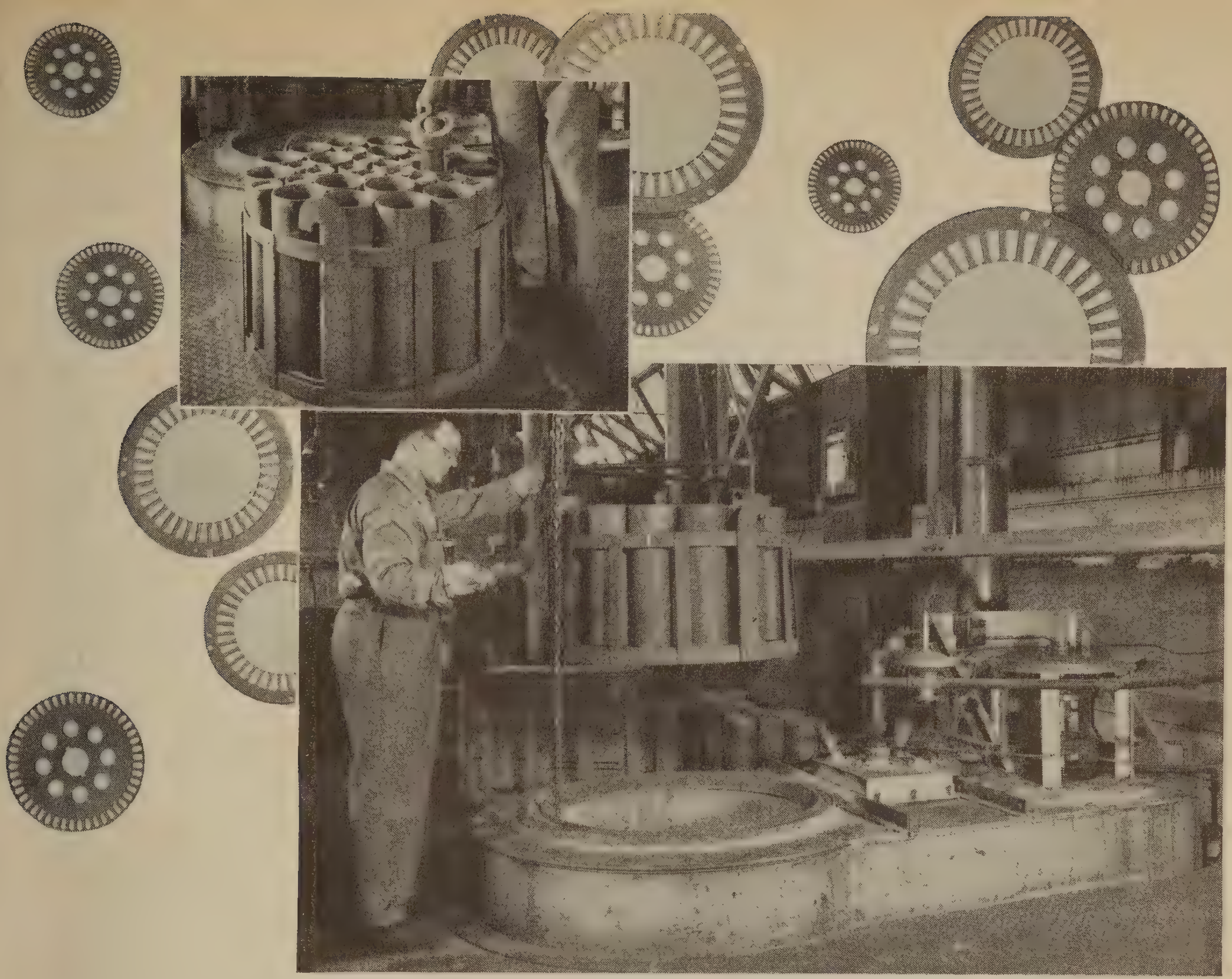
• **Edward M. Douglas,** vice-president of International Business Machines Corp., New York, has been elected a director. He joined the company in 1925.

• **John J. Harding,** president of the Massillon Aluminum Co. of Massillon, Ohio, and a member of the executive committee of Ekco Products Co. of Chicago, which owns the Massillon Aluminum Co., will resign as of Feb. 1, 1948.

• **Harry J. Williams,** formerly associate editor of American Machinist and Product Engineering, New York, has joined Columbia Steel Co., a U. S. Steel Corp. subsidiary, as assistant to the director of public relations with offices in San Francisco.

• **William H. Collins** has been appointed director of advertising of Dravo Corp., Pittsburgh. Mr. Collins comes to Dravo from the Scott Paper Co., where he had been employed as assistant advertising manager since 1937.

• **A. Pitann** has been appointed vice-president in charge of sales of the Precision Scientific Co. of Chicago. **Richard Bergen** has been named sales manager. **Ronald Jenkins,** formerly with Will Corp., replaces Mr. Bergen as New York representative. **Fred Hermann** joins the staff as director and assistant to the president. **B. J. Seldess** has been appointed treasurer of the company. **T. Ryan,** formerly of Adler Mfg. Co., succeeds **R. H. Eddy** as personnel manager. Mr. Eddy has been named director of purchases.



LINDBERG SUPER CYCLONE INCREASES PRODUCTION 58% PER SQ-FT-HR.

Heating equipment manufacturer anneals electric motor laminations twice as fast in Lindberg Super Cyclone—increases production 58% per sq-ft-hr.

A Chicago manufacturer of domestic heating equipment and quenching medium coolers installed a Super Cyclone to anneal rotor and stator laminations used in the manufacture of electric motors. Laminations of 24 gauge silicon sheet stock are loaded into special annealing tubes and sealed with fire clay—permitting just the slight amount of oxidization desired. An average of 30 tubes (over 22,400 laminations) are carried vertically on each fixture as shown, and the circular 33"x38" deep work chamber of the Super Cyclone holds two fixtures—over 44,000 laminations per heat. The laminations (2,400 lbs.), plus the tubes and fixtures (800 lbs.), reach annealing temperature of 1375°F—1450°F in only 4½ hours—twice as fast through the use of 100% forced convection heating.

Unlike conventional box type radiant heat furnaces which heat work nearest the heat source first—then must transmit heat to adjacent work, and so on to the center of the charge, the powerful Super Cyclone blower fan forces accurately heated air through every part of the charge—all parts heat at the same time. No lag!

Work is held at annealing temperature for one hour, partially cooled for one hour, then removed and air cooled while two more loaded fixtures are immediately lowered into the work chamber for the next annealing operation. 88,000 laminations weighing 4,800 lbs., are annealed in 13 hours—(*Two* cycles in *one* Super Cyclone requiring only 5x10 feet, or 50 square feet of floor space.) To handle the same amount of work in box containers in conventional box furnaces would take 13 hours in *TWO* 36x60x30" chamber furnaces requiring 5x8 feet each, or 80 square feet of floor space for the *two* furnaces. Production per sq ft of floor space would be only 4.6 lbs.

The Super Cyclone does the same amount of work in only 50 square feet. Production per sq-ft-hr increases to 7.3—58% more!

Annealing of laminations is but one of the many applications of the Super Cyclone—a 5-in-1 furnace that anneals, hardens, normalizes, tempers and nitrides. Lindberg Engineering Company, 2452 West Hubbard St., Chicago 12, Illinois.

Bulletin 130, "Lindberg Super Cyclone," is available on request.

LINDBERG FURNACES

• **Roger C. Sonnemann** has been appointed industrial relations director for the Monsanto Chemical Co. plant in Everett, Mass. Mr. Sonneman joined Monsanto at St. Louis in 1940 and in 1942 was transferred to Everett as assistant superintendent of the phthalic anhydride department. He was appointed superintendent of the sulfuric acid department in 1946.

• **L. F. McCaffrey,** special engineer for the metal industries in the Allis-Chalmers industrial sales department, is now located in the company's Pittsburgh district office. Mr. McCaffrey's services will continue to be available to all of the company's regional, district, branch offices and product departments on matters concerning steel industry problems. Prior to joining Allis-Chalmers in 1945, Mr. McCaffrey served as assistant works manager in charge of operation at the Algoma Steel Co., Ontario, Canada, and formerly was associated with Jones & Laughlin Steel Co., Crucible Steel Co., Weirton Steel Co., Otis Steel Co., Ford Motor Co. and Republic Steel Corp.

• **Ellis L. Redden** has been appointed manager of sales promotion and training, **Joseph A. Schulte,** advertising production supervisor, and **Paul A. Ryan,** director of public relations and publicity, Crosley Div., the Avco Mfg. Corp., Cincinnati. Mr. Redden comes to Crosley from the Norge Div. of the Borg-Warner Corp. where he was manager of sales promotion and training for more than 2 years. Mr. Schulte comes to Crosley from the Associated Advertising Agency where he was production manager. Mr. Ryan, who came to Crosley in 1943, has, for the past 3 years, been assistant to the director of advertising and public relations.

• **E. E. Howe** has resigned as an assistant director of research, Chicago Vitreous Enamel Product Co., to act as manager, porcelain enamel division, for the Lustron Corp., Columbus, Ohio.

• **Frank L. Estep,** electrical and mechanical engineer, has become associated with Barium Steel Corp., Canton, Ohio. He will supervise and advise on activities of the 16 subsidiaries of the company.

SAMUEL KOFFSKY, general manager, Simmons Fastener Corp.

• **Samuel Koffsky,** chief engineer of the Simmons Machine Tool Corp. of Albany, has been named general manager of the Simmons Fastener Corp., Albany. Mr. Koffsky will remain in charge of engineering of the parent company. He has been associated with Simmons for approximately 15 years.

• **Karl M. Greiner** has been appointed general sales manager of Packard Motor Car Co., Detroit, succeeding **Lyman W. Slack,** resigned. Mr. Greiner has been parts and service manager since 1943. **C. E. Briggs** has been appointed assistant general sales manager of Packard. He had previously been assistant general sales manager in charge of eastern United States and Canada.

• **George N. Vitt** has resigned from his position of assistant to the president of the A. F. Holden Co. of New Haven, Conn., which he occupied for several years, to become the secretary, member of the board of directors and manager of the John Ek Industries, Inc. of Guilford, Conn.

• **Richmond A. Mead** has been appointed policy and organization analyst on the Willys-Overland Motors administrative planning staff, Toledo. Just prior to joining Willys-Overland Motors, Mr. Mead was associated with Aircraft Service at Bradley Field, Hartford, Conn., and Willis Air Service, Teterboro, N. J.

• **J. Paul Keefe,** formerly associated with Ingalls Shipbuilding Corp., Pascagoula, Miss., has been named director of industrial relations for the Alabama Dry Dock & Shipbuilding Co., Mobile, Ala.

• **Robert O. Boden,** currently serving as national president of the American Society of Training Directors, has been appointed development director for Pittsburgh Plate Glass Co., Pittsburgh.

• **Frederick P. Hauck** has been elected vice-president and director of Michigan Abrasive Co., Detroit. Mr. Hauck first was associated with Michigan Abrasive as a technical consultant. After several years in this capacity, he devoted his full time to Michigan Abrasive Co. as factory manager in charge of production and research.

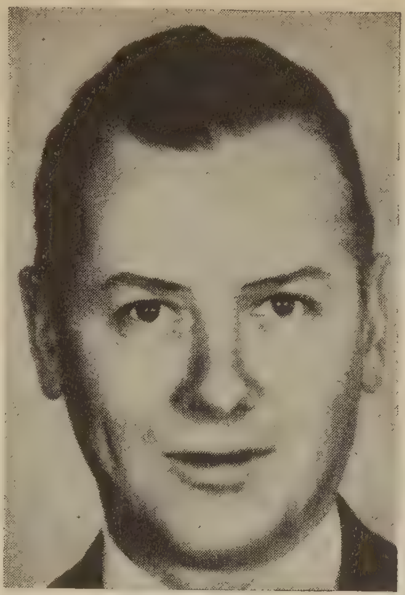
• **Ab Martin, L. H. Means, E. S. McKay** and **D. J. Sullivan** have been appointed assistants to W. V. Merrihue, manager of employee and community relations in the General Electric Co.'s apparatus department, Schenectady. Mr. Martin has been named assistant to the manager, in charge of employee relations; Mr. Means, assistant to the manager, in charge of labor relations; Mr. McKay, assistant to the manager, in charge of community relations, and Mr. Sullivan, assistant to the manager, in charge of opinion research and program development. Also, **W. V. O'Brien** has been named assistant general manager of sales of GE's apparatus department; **R. M. Darrin,** manager of central station divisions, succeeding Mr. O'Brien; **J. C. Miller,** assistant to the manager of sales, and **H. P. Bish,** manager of aircraft, federal and marine divisions.

• **Harold E. Bruns,** formerly secretary and treasurer of the Lauson Co., New Holstein, Wis., has been elected president and general manager of the company. **R. H. Bader,** formerly purchasing agent, succeeds Mr. Bruns as secretary and treasurer. **E. A. Longenecker,** who had been president and general manager, has resigned to accept the position of president and general manager of the LeRoi Co., Milwaukee.

- **Eugene A. Lindemann,** president of the A. J. Lindemann & Hoverson Co., Milwaukee, has been elected a director of Ampco Metal, Inc., Milwaukee, to fill the vacancy caused by the death of **Samuel L. Schefrin.**

- **E. L. Byan** has been named manager of sales for coated fabric, calendered sheet, coated wire products and Playponds; **William M. Gaston** manager of distributors' sales; **R. L. Hill,** manager of sales for extruded and molded products; and **N. P. Singleton,** manager of sales for cast and calendered film, coated paper and packaging material, in the recently created plastic materials sales division of B. F. Goodrich Co., Akron, Ohio. Mr. Byan has been with the company since 1934. Mr. Gaston joined the organization in 1926, was credit manager in its St. Louis district when he entered naval service in 1942. Mr. Hill has been with the company since 1945 and Mr. Singleton since 1939.

- **William W. Crittenden** has been named manager of the special projects department of the Westinghouse Electric International Co., Pittsburgh. He succeeds **J. R. Bejarano,** who has resigned to join a Brazilian company. Mr. Crittenden joined the Westinghouse Electric International Co. 22 years ago as an order clerk, becoming successively assistant manager of the merchandising department, supervisor of the company's Washington office, manager of the regional sales department, and manager of the eastern hemisphere department. He was made assistant manager of the special projects department last year.



M. A. HUNTER, general manufacturing manager, Federal-Mogul Corp.

- **M. A. Hunter** has been appointed general manufacturing manager of Federal-Mogul Corp., Detroit. Mr. Hunter, who became a director of the corporation in 1946, and manager of the company's Greenville, Mich., plant in 1940, will direct manufacturing operations in all of the company's plants in Detroit, Greenville and St. Johns, Mich., Mooresville, Ind. and San Francisco and Fresno, Calif. He joined Federal-Mogul as a record clerk in 1924.

- **Walter M. Boyden** has been appointed sales manager of the Hy-Pro Tool Co., New Bedford, Mass.

- **E. M. Detwiler,** assistant manager of the Buffalo works of the Worthington Pump & Machinery Corp., has been named manager of the corporation's Holyoke, Mass. works. He succeeded **Herman J. Schorle,** who has resigned.

- **J. Heath Braselmann** has joined the sales force of Cans, Inc., Chicago. Mr. Braselmann formerly was associated with the Liberty Can Co., for 25 years as representative in charge of their New York sales office.

- **Leroy W. Westerbeck** has been appointed manager of the Los Angeles warehouse of A. M. Castle & Co., succeeding **John L. Robertson** who recently resigned. Mr. Westerbeck has been manager of sales at the Los Angeles warehouse for the past 23 years and will be succeeded by **Harry Christensen.** Mr. Christensen has been assistant general manager of sales for the company in Chicago for the past 10 years and prior to that was a regular salesman for the company for 12 years. **Robert J. Heggie,** who has been with the company for 13 years, has been named assistant general sales manager in Chicago. **Harry Falkenberg** succeeds Mr. Heggie as secretary and will continue to manage the accounting department which he has been in charge of for 2 years.

- **L. H. Van Dike, Jr.** has been appointed Detroit representative of John A. Roebling's Sons Co., Trenton, N. J., replacing the late **Harry T. Hirbe.** Mr. Van Dike has been associated with the company since 1946.

- **P. L. Edwards** has been appointed assistant manager of the central district office in Pittsburgh, of Raybestos-Manhattan, Inc., Manhattan Rubber Div., Passaic, N. J. Mr. Edwards, who has been manager of the products division of Manhattan's western district office, started with the company 29 years ago as a clerk in the Chicago office. He will take over his new duties on Jan. 1.

...OBITUARY...

- **William P. Thistlethwaite,** 87, president of Ontario Drill Co., East Rochester, N. Y., since 1900, died recently.

- **Joseph W. McFarland,** 55, president and general manager of the National Gypsum Co., Buffalo, died Dec. 8.

- **Augustus E. Saunders,** vice-president and director of the Nicholson File Co., Providence, died recently.

- **Clarence E. Bradburn,** 60, founder and president of Pacific Iron & Steel Co., Los Angeles, died Dec. 5.

- **A. E. Harrison,** 81, retired general superintendent of foundries and pattern shops at the Allis-Chalmers Mfg. Co., Milwaukee, died recently.

- **Norris R. Buckingham** died Dec. 12. He was vice-president and general manager of Atlas Drop Forge Co., Lansing, Mich., where he had spent his entire business career since 1916.

- **Arthur P. Higgins,** 67, vice-president and secretary of the Worcester Pressed Steel Co., Worcester, Mass., died Dec. 9. He was associated with the company for 42 years.

European Letter . . .

• Main issue of recent Conference was whether and how the unity of Germany should be restored . . . Western Powers believe central government established now would be under strong Communist pressure.

LONDON — The Foreign Ministers have conferred for a fortnight, and the best that can be said of their efforts is that there is no trace of agreed solution. After a week's disagreement on political issues, they turned to the economic field and the outlook was no more hopeful. A visitor from another planet, unskilled in giving diplomatic language its real, and hidden, meaning, would find this persistence of disagreement very puzzling.

The main issue of the Conference, by common consent, was whether, and how, the unity of Germany should be restored. All the delegates (except perhaps the French) vied with each other for the role of chief champion of German unity. All were convinced that Germany should become once more a political and economic unit. All were agreed that there should be a central government with effective powers. All were agreed that the removal of the present barriers to the free flow of goods and services is vital not only to German revival but to Europe itself.

If German unity were really the main object and the first priority of each delegation, it is hard to see how agreement could have been avoided. But in fact unity was little more than a symbol or slogan. The delegates were carrying on a sort of diplomatic double talk. They spoke of the necessity for Germany to be politically and economically whole. They thought about the danger that it might be wholly Communist, or wholly absorbed in the Marshall Plan.

THE political discussions turned, not on the desirability of central government, but on the kind of government it would turn out to be. The Western Powers believe, rightly or wrongly, that a central government established in Berlin at the present time would be under such strong Communist pressure that it would be not much more than a Soviet tool. Moreover, they believe that the political unification of the country would offer such opportunities to the Communist-controlled SED (the Socialist Unity Party) and its nationalist demagogy that all Germany would be in an uproar.

The Russians on their side believe that their control of the SED and their strategic position in Berlin would give nationwide communism a flying start. Both sides may be wrong—indeed, the Western Powers seem to be excessively defeatist about the political development of Germany. But that does not alter the fact that the approach of both sides to the proposal that Germany should be politically united is governed by the same expectation that a united Germany would be a seed-bed for communism.

Reprinted from The London Economist by special permission.—Ed.

When the economic discussions began, it was equally necessary to distinguish between the forms and the substance of the debates. Officially, economic unity was the issue. To elaborate it, both sides had gone back to documents and proposals already months old. Mr. Bevin's main points—that all German resources should be pooled for reconstruction, that there should be a common import-export program, that the repayment of money spent by the allies in maintaining Germany should take precedence over reparations, that a Russian share in the control of the Ruhr should be conceded only if joint control were also established over industries in the Eastern Zone—all these points were already elaborated in March.

Mr. Molotov went back even further. His two central demands—that all four Powers should share in the control of the Ruhr and that $10 billion should be paid in reparations from current production—have been fished up unchanged from the documents presented during the Paris discussions in July 1946.

BUT since the days when the Foreign Ministers met in Paris and in Moscow, a profound change has occurred in the economic life of Europe. Mr. Marshall has made his offer of American aid to a united European recovery program. The mere possibility of a Marshall Plan has created a climate for the talks on Germany so new that it can be only with really remarkable self-restraint that neither Mr. Bevin nor Mr. Marshall referred to it. The real issue before the Conference was not so much German economic unity in the abstract as the problem of what to do with a Germany half of which is in the course of being geared into the Marshall Plan, while the other half will be expected to wreck and oppose and sabotage that plan at every point.

Under these conditions, there are only two ways in which German economic unity could be secured by the agreement of all the occupying powers. One would be that the whole of Germany should be excluded from the Marshall Plan, the other that the whole of Germany should be included. It is a little difficult to envisage what immediate economic difference would be made by Germany's exclusion from the plan.

If Russia had a say in the economic control of Western Germany, there might be an attempt—possibly in the supposed interests of a new joint import-export plan—to divert to other markets vital resources, such as coal, whose availability for the countries of the West was assumed in the Paris Report, and these diversions would be the greater if the Russians also got their way on reparations.

But it is not in amendments of the figures in the Paris Report—important though these might be—

that the effect of Germany's exclusion from the Marshall Plan would have to be sought, but rather in the blow that it would strike at the whole conception of the plan. In its first year or two, it will inevitably take the form of dollar aid to a number of hard-pressed European states, and the exclusion of one might not harm—might even benefit—the other 15. But if the plan claims to be more than a coordinated dole, the claim rests on what it can do, in a rather longer run, to promote the growth of a real community of interest, political and economic, in Western Europe, and for this the participation of Germany, or at least of Western Germany, is completely, and obviously, essential.

THE exclusion of Germany would not bring any short-term reliefs to America and Britain to offset this retreat from longer-term ambitions. No saving of dollars or sterling would follow, since, with a quarter of the old Reich transferred to Poland and millions of Germans expelled from the lost lands, Eastern Germany certainly has no surplus of food to export to the Western Zones. In fact, if the Western Powers carried some responsibility for the whole of Germany, they might find themselves under a moral obligation to spend more, not less, in order to feed the hungry people in the Eastern Zone.

Nor would this extra assistance necessarily be temporary. The Russians demand that in return for conceding economic unity they should be given some guarantee that Germany will deliver reparations from current production. But at what point could the shattered German economy begin paying reparations? No longer self-supporting in food, needing every sort of outside assistance—even steel—for its recovery, Germany will have to devote the whole of its exporting capacity to the task of paying for the imports of food and raw materials it requires. Reparations would be possible only if the West were prepared to give larger and more permanent subsidies for German imports. Economic unity under these conditions would mean bigger and more lasting doles, not the steady restoration of a viable German state.

The other method of combining German economic unity with the Marshall Plan would be to bring the whole of the reunited German state within the orbit of the plan. But the imagination boggles at the task of devising a method by which the Russians would both keep a voice in German affairs and allow their own Zone to become an integral part of a plan they believe to be aimed against them.

At a time when such nations as Poland and Czechoslovakia are being encouraged as far as possible to divert their trade from the West and link their economies more closely with those of their Eastern neighbors, is it likely that Russian policy would commit a complete *volte face* in the case of Germany and cheerfully acquiesce in the powerhouse of Europe being restored to assist the plan?

TO state the dilemma bluntly seems to leave no hope of settlement, no margin for adjustment on either side. This is almost certainly the reason why Mr. Bevin and Mr. Marshall forebore from the provocation of mentioning the plan. It can, after all, be argued that if muffling the issues leaves even the smallest opportunity for some completely new initiative, then the muffling is worth while. But it entails a danger—the danger that muffled differences may breed muddled ideas. It is a confusion at this stage to think of German unity as an absolute value, independent of the kind of unity achieved, and of the price paid for it.

For instance, if the price to be paid for German economic unity today were a crippling or an abandonment of the Marshall Plan, that price would be too high. For the next 5 years, at least, Western diplomacy can have only one absolutely top priority—and that is to insure the unquestioned success of the recovery plan for Western Europe. If German economic unity assists that end, well and good. But the touchstone of every concession made on the German issue, of any bargain offered or bait put out must be: Will this move make it more or less difficult to revive the West? From this it follows inevitably that the only Russian concessions and initiatives which the Western diplomats could afford to accept are ones which go very much further than any Mr. Molotov in his first fortnight seemed inclined to make.

The fact that this phase in the endless bargaining between East and West has broken down need not, however, too greatly disturb the Western Powers so long as they remember that it is not the final phase. Since the Marshall offer was made, a new factor has entered into the negotiations—the recovery of economic initiative by the West—and provided the Western Powers pursue their objective of Western economic revival with absolute single-mindedness, they will find that the opportunities for further parleying with the Russians will create themselves.

Mr. Molotov is a little on the defensive when he leaves the safe ground of political unity and a central government. At one point he even proposed—and then withdrew—a postponement of the whole discussion. The defensiveness, the uncertainty will increase as the Marshall program gathers momentum and restores men's hope. It follows that the Western Powers are likely to find themselves in a steadily improving position for negotiation with the Russians, provided they do not throw away their position at this stage, in what is virtually the first round.

Their firmness in maintaining their basic position—that no concessions on Germany shall weaken the Marshall Plan—can and should be coupled with the utmost readiness to reconvene the Foreign Ministers' Conference at any time and even to propose themselves that a further meeting should take place 6 months or a year hence. It is useless to deny that East and West are involved in a struggle for the possession of the German soul; but the struggle is, should be and can remain a peaceful one.

Will Increase Production

Buffalo

• • • **The Ford Motor Co.** will increase production of the Buffalo assembly plant by 25 to 30 pct next year, and employment will be boosted accordingly, plant manager E. C. Miller announced.

The plant, with a theoretical capacity of 550 cars and trucks, at present is turning out about 300 daily with one shift.

Industrial News Summary...

- ***U. S. Leads in World Steel***
- ***Will Keep Position in 1948***
- ***Tinkering Seen as Deterrent***

AMID all the frustrated talk and thinking in this country over controls and allocations it is significant that the United States will produce 57 pct of the total world steel production for 1947. This country alone, without controls, dictatorships and with a free play of distribution based on supply and demand, will produce this year 85 million tons of steel ingots compared to a world production of steel estimated at 148.6 million net tons of steel ingots.

It is estimated that Russia will have produced 21.8 million tons of steel ingots this year compared with 21.5 million tons in 1946. The Russian output this year will be 14.6 pct of world steel production.

England is expected this year to reach 14.1 million tons of steel or 9.5 pct of world output, while France will knock out 6.6 million tons or 4.4 pct of the grand total. About 4.1 million tons of steel ingots, which constitutes 2.7 pct of the grand total, will be made in Germany while the total output of all other countries in the world will be 16.9 millions tons or 11.4 pct of world steel production in 1947.

It will be a long time before Russia will be able to step up its steel output to seriously vie with either the output of this country or the combined production of the United States, England and France. The last three nations this year will produce about 105.7 million tons of steel ingots or 71 pct of the world total.

UNLESS the steel distribution picture is "muxed up" during 1948 with half-baked attempts at Administration inspired allocation and control this country will surpass the 1947 peak production total. While the steel industry has apparently skinned by the probability of strict legislative controls and allocations, the spectre of voluntary agreements between steel firms and the government still looms as a distinct possibility.

To believe that such a setup would produce any more steel or make matters of distribution any better than they are now is to fly in the face of facts which are hardly more than a year old. Voluntary allocations, while less dangerous to distribution than mandatory controls, are nevertheless deterrent to the working of the law of supply and demand.

Steel consumers are supposed to be the ones who would benefit from a voluntary system of steel allocations. Their reception of such an idea during the past several weeks has been anything but joyous. During that period steel customers have tripped over each other in an attempt to buy every ton of steel that was not nailed down. They have exerted extreme pressure on regular steel mill sources for deliveries while at the same time enabling gray marketeers to enjoy one of the best Christmas seasons they are apt to have for many a year.

Such action on the part of steel customers indicates a realistic acceptance of a view that the country is in the midst of an inflationary movement and that any attempt to place controls over a basic industry which has already outdone itself in an attempt to distribute steel on a fair basis will leave steel users in worse shape than they were before.

Demand for most steel products this week is so heavy it cannot be accurately measured. Deliveries are so extended on flat-rolled items and pipe that mills are turning down business on the basis that it would be rediculous to put it on the books now. Despite the substantial sales of finished goods into consuming fields no basic steel official is ready to name any month in 1948 when the heavy demand will have sloughed off.

It is doubtful if steel consumers will depart from their practice of using all manner of pressure for steel deliveries for some time to come. Repeated checks have failed to disclose that steel inventories are exceptionally large when compared with total manufacturing activities and total sales of products made from steel.

INDICATIONS are that it will be many months before the size of steel stocks in customers hands will have any sobering effect on users' buying habits. This will be the case despite there being little or no chance of a steel labor incident in 1948. The only possibility of a temporary slowup in steel output next year involves the coal miners. If it takes some time to meet their demands there may be a temporary slowup in steel production due to a coke shortage.

Because of Christmas holidays there will be some curtailment of steel output this week. But some firms are going to work their steelmaking equipment through the Christmas holidays by paying their workers premium time. Steel ingot output this week is down 10 points to 88 pct of rated capacity. Next week the rate is expected to rebound to 97 or 98 pct.

Major scrap consumers are remaining out of the market and no important purchases are expected to be made until after the first of the year. Part of this lethargy is for income tax purposes. Some indication, however, of what may happen to the market can be taken from recent sales in the East. Prices there, while receding from top levels, stopped at some distance from the point to which scrap buyers had hoped to drive down the price. The same situation is expected to prevail in major consuming centers such as Pittsburgh, Chicago and Philadelphia. THE IRON AGE scrap composite price this week is unchanged at $39.75 per gross ton.

• **NO SALE**—Forty miles of 16-in. API line pipe for sale at $260.00 a ton f.o.b. Pittsburgh, found no takers. Oil and utility companies claimed the price for this ½-in. wall electric welded pipe was too far out of line. The pipe may be inspected by the purchaser and, reportedly, it will meet all range 3 specifications for such material.

• **SCRAP RETURN**—The Martin steel subcommittee of the Senate Small Business Committee has assured that scrap involved in the Canterbury Corp. purchase overseas will be returned to the United States. Also, it has been told that an additional estimated 275,000 tons will become available for early shipment to this country. Of this amount, 60,000 tons was said to be available immediately, 110,000 tons is expected to come from unsalable surplus in the hands of the Foreign Liquidation Office, and an additional 105,000 tons, to become available at the rate of 10,000 to 15,000 tons a month, from the demilitarization program. Of this last amount it is believed that 30,000 tons can be shipped by the end of the year.

• **ADVISORY COUNCIL** — The Interior Dept. has announced the formation of a National Minerals Advisory Council, consisting of 31 representatives of United States minerals industries. The new council, made up of representatives of large and small producers in all branches of the minerals industries, will advise Secretary Krug on mineral supply problems. Six functional committees have been established by the council to prepare reports on marginal deposits, public lands, technology, stockpiles, American foreign mining activities, and exploration and development incentives.

• **CONSOLIDATED STEEL CASE**—The Supreme Court on Dec. 22 agreed to review a lower court decision in which the U. S. District Court at Wilmington, Del., ruled that purchase of Consolidated Steel Corp. by the U. S. Steel Corp. was not in violation of the Sherman Anti-trust Act. The Justice Dept. asked for a writ of certiorari on Dec. 2, appealing from the lower court's decision of Nov. 7. The case will probably not come up for argument before mid-February.

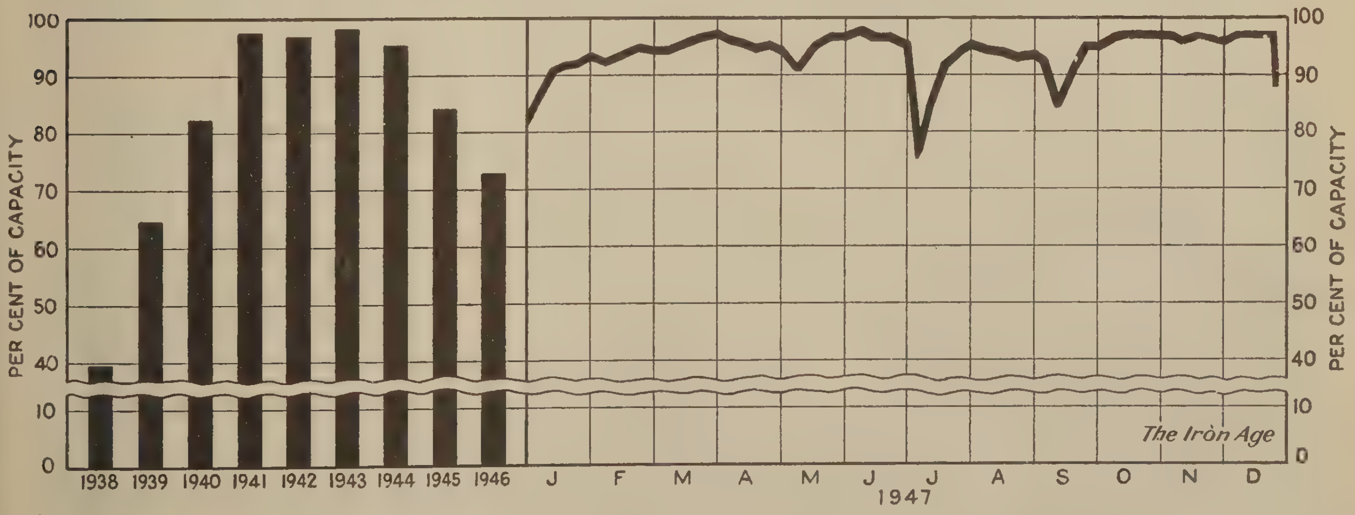
• **METAL POWDER PRICE INCREASES**—Some producers have gone over costs in the last few weeks and have announced major increases in the prices of iron and nonferrous metal powders. One producer is now in a position to market domestic sponge iron powder at 10¢ per lb in ton lots which is expected to compete with Swedish iron powder in the production of sintered parts.

• **RUSSIAN SWEDISH TRADE**—Shipments under the 1946 trade agreement, scheduled at $28 millions each way per year, have been far below expectations. Russians have been complaining about Swedish prices. Russian pig iron shipments to Sweden have amounted to 15,000 tons, compared with a quota of 10,000 tons. Russia has reneged on a 25,000 ton scrap quota, but has shipped 200 tons on a 1000 tons lead quota and 100 tons of a 250 ton nickel quota. At the end of August Russia had shipped 5000 tons on a 25,000 ton quota of chrome ore, and 6000 tons on a 15,000 ton manganese quota.

• **BRITISH STEEL EXPORTS** — At least 3.1 million tons of finished steel will be required for direct and indirect exports from Britain next year. Most of this will be in manufactured articles. Targets for direct exports are in terms of value at September 1947 prices. Assuming that the steel distribution pattern remains about as now, the quota is about equal to 1.2 million tons for the middle of 1948, increasing to an annual rate of 1.3 million tons by the end of the year. The 1946 exports totaled 1.7 million tons, while the 1938 figure was 1.4 million. The restriction of direct steel shipments next year is designed to aid British steel consumers which may be able to export to dollar countries.

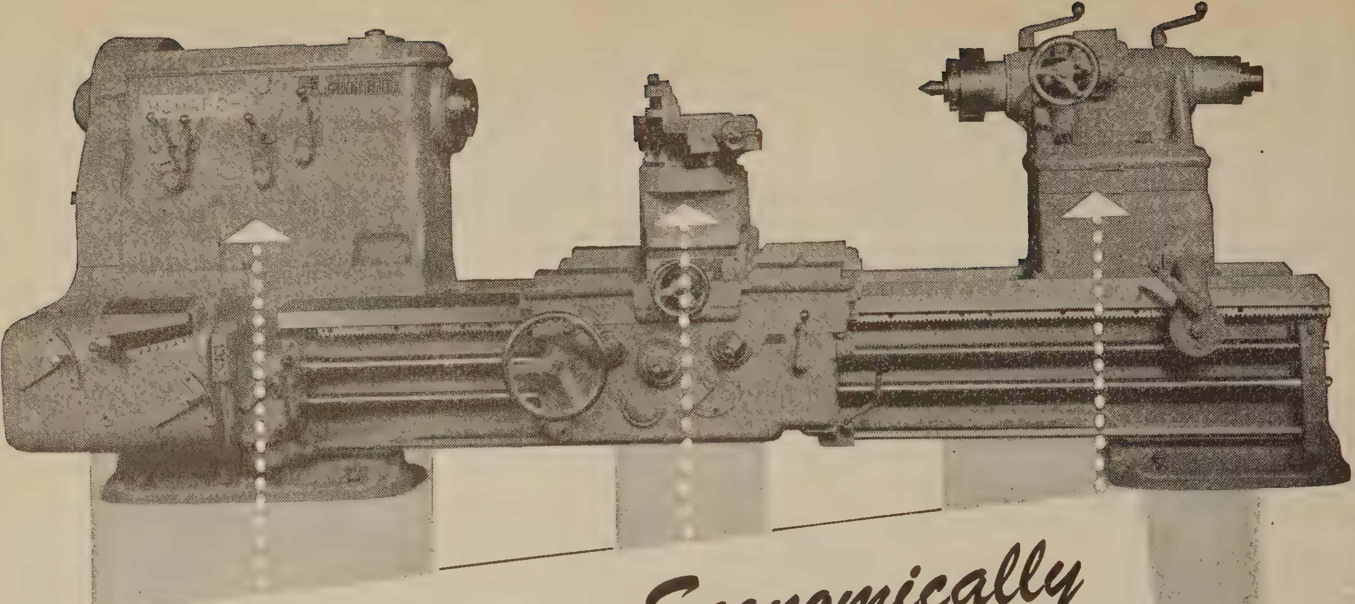
• **HIGH PRESSURE**—The efforts steel users are putting out to get steel from their legitimate supply sources are sometimes as amazing as some reported gray market deals. Despite elaborate visual sales presentations and high pressure expediters, almost all are turned down with the statement that they can expect only their fair share. Some don't quit then—it's not too unusual for the steel company to find the original pressure followed up by visits from bankers and then from politicians.

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
December 16...	104.0*	94.5	93.0	93.5	93.5*	102.0	101.0	102.0	102.0*	111.5	100.0	96.0	108.0	98.0
December 23...	91.0	80.5	83.0	93.5	90.0	98.5	97.0	99.0	101.0	114.0	100.0	90.0	96.5	88.0

* Revised.



FOR ADDED SWING — *Economically*

Need added swing for an occasional big part—or for turning shafts with a previously-machined large-diameter section? Is your production mostly modified disc shapes—light cuts on big diameters?

If your answer is *yes*—for any of these reasons—Monarch has a practical, economical way of giving you that extra swing without the unnecessary extra power and expense of ponderous oversize machines. Let our foundry pour added swing into a new Monarch for you—*we can raise the machine in the sand.*

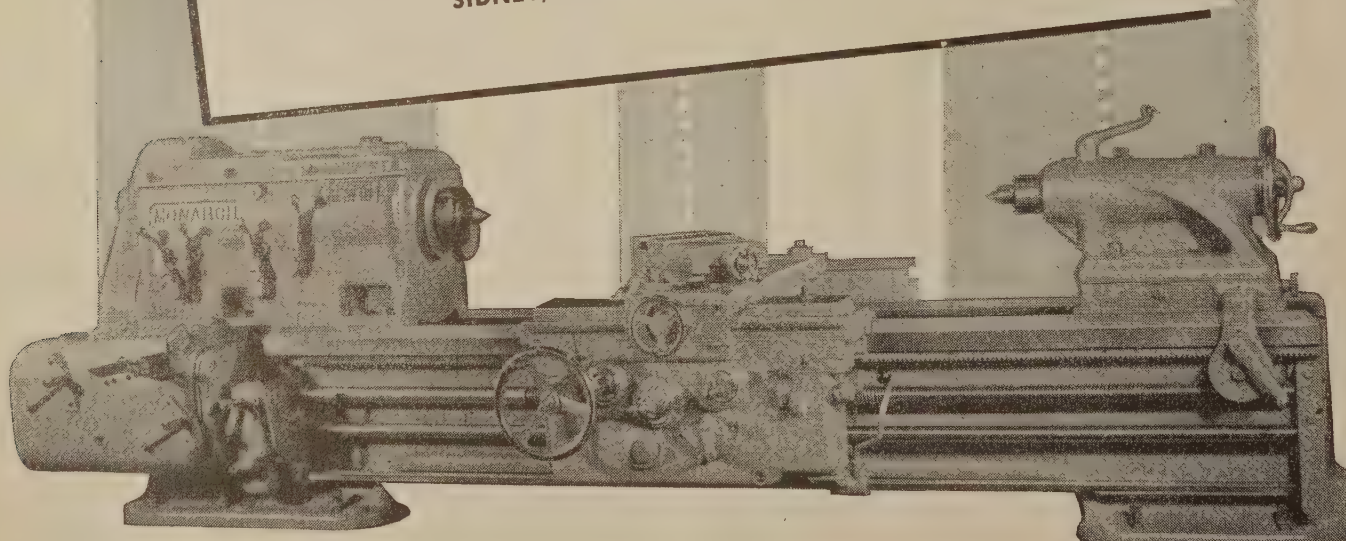
Monarch builds its *standard* machines with the exceptionally wide beds and rugged proportions necessary to give you added swing, without sacrificing normal high production and precision operation. All raised castings are machined in standard jigs and fixtures, this being further assurance of the same accurate performance for which standard Monarch Lathes are famous.

If our application engineer says we can save you money on your regular production, a standard Monarch machine (any size from 12″ swing up) will be modified to give you a special-order raised machine that matches your swing requirements. May we send an engineer to talk it over?

ACCURACY · ECONOMY · LONG LIFE

Monarch
TURNING MACHINES

THE MONARCH MACHINE TOOL CO.
SIDNEY, OHIO



Failure of British Steel Allocation Program Brings New Plan

New York

• • • **Due to sloppy** operation and inadequate basic planning, the steel allocation system which has been in operation in Great Britain since the end of the war is being discarded. The industry will start operating under a new plan on Mar. 31, 1948, but the first steps in the changeover will begin Jan. 1.

Fundamentally the new system exchanges one elaborate system of paperwork for another. At the moment, the new plan is somewhat simpler than the old. Government officials hope that the revised program will put allocations on a more realistic basis. Customers have been having a hard time getting delivery from steel mills on stuff allocated by the government in past months.

For all of this year the steel industry has been carrying backlogs at the beginning of each quarterly rationing period larger that it hoped to roll. Thus, at the beginning of the second quarter, while the various government departments continued to grind out additional authorizations for more steel to consumers, the industry started with more Phantom tonnage left over from the first quarter than they hoped to roll during the second.

The new program will accomplish, incidentally, for the British industry, what American mills took care of in November and December mills' schedules of their own volition. The slate is to be wiped as nearly clean as possible. After a careful shuffling, all consumers are to be dealt a new hand; the topheavy backlogs will be eliminated.

The system which has been in operation during the past 2 years has been an outgrowth of the allocations plan used during the war. It was developed to adapt itself to large bulk allocations for specific armament programs. Allocations since the war have been made through various government departments to end users. This is the system that some Administration leaders favor for operation in a new control system for the American steel industry.

Inadequate Basic Planning, Sloppy Operation Listed As Causes of Failure

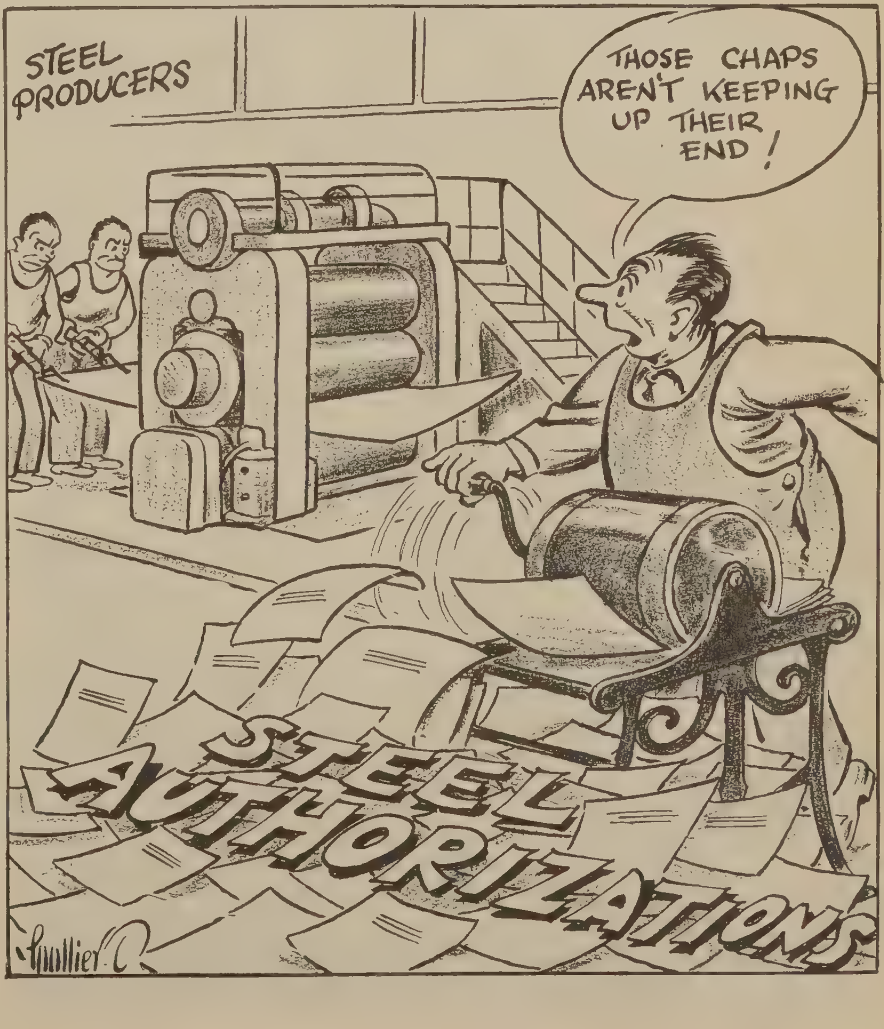
° ° °

Since the plan was originally developed in Britain, there have been many modifications and changes. The exact intent of the government has become obscure by an overlapping of directives and orders. Special arrangements are being made to make sure that everybody knows just what the government wants, and how much rope everyone is to be allowed.

The complexities of placing steel allocations far enough in advance to permit adequate planning by consumers for mass production, without crystal-balling rather unpredictable steel developments have caused a lot of the previous trouble. There was considerable laxity in applying some of the rules that have been in existence on using the allocations that have been granted.

There has been considerable change in the situation in the British steel delivery since the end of the war. For a period up until the third quarter of 1946 there were fairly adequate steel supplies for everyone. Indeed, the industry spokesmen predicted bravely that there would be plenty of steel during 1947. But the strong appearance of postwar steel demand during the middle of 1946 began

New Allocation System in Britain



to bring out comment on the steel shortage, and later setbacks have accentuated the problem.

As the shortage got worse, and interruptions to production in all factories became more common, steel mills did not follow too closely the dates specified on authorizations.

Thus, many allocations granted for several months ago, have not been effectively cancelled, even though they were not rolled during the specified period. The new plan is set up to be firm on this point. If an allocation is not delivered when scheduled, it lapses —except in special cases where it can be rolled in the following quarter. But then it is really finished.

A new **innovation** of the program will be a small body of government officials appointed to travel around the industry to make sure that everyone pays strict attention to the rules. They will be stationed in various regions and travel within those regions.

The same problem became acute for sheets and tinplate in Britain last year, and about the same revisions were made for these specialized products at that time as are being made generally for all other steel products now.

The export drive, which was called essential last year, and is now a matter of life and death for the United Kingdom, must get the greatest benefit from the allocations under the new priority plan. The government has been working on the problem for the past year. But the necessity for setting up new priorities for export industries made it essential. There was already a superpriority system in operation above the allocation plan, and it is understood that this special reservation of steel for transportation, power and atomic energy uses will still be protected under the new system.

Talk is now active in this country over the necessity for allocations. This story points up allocation trouble in England. It also recalls past experience in this country when priorities, ratings and allocations plagued steelmakers.—Editor

Shortage of Pig Iron Sends Price of Cast Scrap to New Highs

New York

• • • **Cast iron scrap** prices are experiencing one of their sharpest upward swings in the history of the industry. Unlimited competition among foundries for the scant available supplies is the biggest factor in driving prices upward. The acute shortage of pig iron, in steel making plants and foundries, lies behind the strong demand for cast scrap grades.

No. 1 cast is quoted this week at $53.00 to $54.00 in Pittsburgh, $56.00 to $60.00 at Cleveland, and at $62.00 to $65.00 in Chicago. These levels are from $10.00 to $15.00 higher than the levels quoted late in August, when the present upturn began.

Behind the pig iron shortage is the scarcity of coke. The general tight position of pig iron has induced most steelmaking firms to reduce the supply of iron being sold to the merchant trade in favor of their own steelmaking operations. High steelmaking scrap prices also are serving to step up consumption of pig iron by steel producers.

Thus the supply of pig iron available to foundries all over the country has been dwindling. Long cross-hauls of pig iron at high prices has become the rule, rather than the exception. When western pig iron has been available, eastern consumers have paid $60.00 per ton for it. When pig iron supplies have dropped, foundries have been forced to replace it with cast scrap.

At the same time, foundry demand for scrap has been expanding since the end of the war—simply because of high demand levels for castings. During the war most foundries were casting ordnance materials. They returned to their peacetime product lines to find overwhelming demand.

The result of this intense pressure on existing supplies of cast scrap grades has been keen price bidding on the part of the foundries in the scrap market. Grading of cast scrap types has become less finicky. Cars of real No. 1 cast are almost a rarity today. When they do move, it is at almost any price the seller wishes to ask. Good machinery cast in one-man pieces, also very rare, will bring almost any price the seller demands. Most cast that is moving is mixed, including about anything in the yard that will break, at record prices.

In a period where a buyers' strike has depressed the price of steelmaking scrap in recent weeks despite high demand and short supply, cast scrap prices have continued their carefree upward swing.

Sheer numbers of bidders in the cast scrap market has made this anomaly possible. Steel mills buy their scrap in larger quan-

NOT-SO-MERRY CHRISTMAS: *The mining camp called Christmas, clinging to the rocky sides of the Dripping Springs Mountains about 75 mi north of Tucson, Ariz., has nothing but its name to remind one of Christmas. This mill, erected in 1928 and busy during the Christmas boom period of the early '30's, stands idle and silent in the lower part of the camp, surrounded by deserted shacks.*

tities than do foundries. The steel firms also carry heavier inventories than do foundries. A few big steelmakers dropping out of the market have a noticeable effect on the steelmaking scrap market—where small purchasers of cast grades cannot produce such shock treatment.

The recent attempt by some large steel foundries to cut the price of railroad specialties is a case in point. The larger foundries in the Pittsburgh district cut their bids on a recent railroad scrap offering by $6.00 to $8.00. The railroad purchasing agents—who make the awards—laughed at them. Even in the limited steel foundry field there were enough desperate operators to permit any reduction in the awards on these rail specialties.

In general the pig iron shortage is a long term one. Next year will see little alleviation of it. The fear of additional furnace shutdowns, and continued shrinkage of the merchant pig iron supply, has excited part of the inflation in prices going on today. There are some foundries which believe, however, that the situation next year may permit some lowering of cast scrap prices.

There is constant discussion of all types of scrap being withheld from the market due to tax considerations on the part of dealers. The story here is that this will release increasing tonnages of scrap on the market after the first of the year. If this factor is influencing the market, it will only have the effect of slightly alleviating the situation, rather than making the general situation substantially better.

Launch Investigation Into Industrial Gray Market Steel Prices

Washington

• • • **Armed with** the authority to subpoena books, records and correspondence, the House Public Works Committee prepared to swing the spotlight of publicity on industrial gray market operations, particularly with reference to fly-by-night steel brokers.

Rep. Andresen, R., Minn., read the names of a number of companies he said should be investigated. "These concerns," he said, "may just be operating as a front for some steel company. I hope the committee will investigate these concerns and also go into the matter of ascertaining if there is a conspiracy to take these products away from the legitimate dealers and manufacturers of this country on the part of certain steel companies."

Mr. Andresen named the following firms as "operating in the gray market" and included prices he said were quoted by the concerns:

	Per Ton
"Emergency Steel Co., 2136 Lincoln Park West, Chicago, Mr. Shane..	$260
Kalden Steel Products Co., 1661 National Bank Bldg., Detroit, Louis H. Golden	240
Bell Iron & Metal Co., 1552 South Drake, Chicago	260
Page Hollister Co., Box 2044, Chicago, C. Johnson	250
Esko Co., Box 2054, Chicago, A. Carlson	240
Crylon Steel Co., 179 West St., New York, E. Londner	220
Atlantic Steel Co., 767 Milwaukee Ave., Chicago, Lou Gantz	310

"We have received offerings from the following companies, listing materials for sale at the prices listed below," Mr. Andresen said:

	Per Ton
"Charles M. Williamson & Associates, 111 W. Washington St., Chicago	$238
Consolidated Metals Corp., 2619-2625 S. Santa Fe Ave., Los Angeles	280
Fill-More Sales, 330 S. Wells St., Chicago	247

"Today we received from the Interstate Steel Service, 4525 W. Fifth Ave., Chicago, offerings as follows," he added:

[*Text*]

12 Gage	Per Lb.
22,000 lb 17½ x 19½ in. H. R. P. O.	$0.105
6000 lb 17⅛ x 84¾ in. H. R.........	.10
43,930 lb 12¾ x 72 in. H. R.	.11
70 tons 14 x 168 in. H. R.	.095
13 Gage	
9000 lb 12½ x 174 in. H. R.	$0.10
5200 lb 15 x 48 in. H. R.	.105
3000 lb 22⅝ x 90¾ in. H. R.	.10
10,000 lb 22⅝ x 120 in. H. R.	.11
7200 lb 14¾ x 72 in. H. R.	.10

The mill price of this steel would run an average of from 5¢ to 6½¢ a lb.

PIPE

We have just received another large shipment of pipe (galvanized and black) all new and we can make prompt shipments at the following sizes and prices:

	GALVANIZED		BLACK	
	Regular Price Per Ft	Gray Market Price Per Ft	Regular Price Per Ft	Gray Market Price Per Ft
⅜ in. pipe	$0.0632	$0.24	$0.0467	$0.17
½ in. Pipe	.0757	.32	.0587	.28
¾ in. Pipe	.0568	.38	.0752	.29
1-in. Pipe	.1367	.46	.1059	.36
1¼ in. Pipe	.1835	.69	.1418	.66

This pipe is in 21-ft length and is sold in full length only. Due to the scarcity of steel, pipe will be scarce for the next 6 months, so order your requirements now. Prices subject to change.

Fox Supply Co.
Box 267, Geneva, Ill.

P.S. Will be glad to quote prices on larger sizes.

[*End Text*]

○ ○ ○

EXPANDING STAINLESS MARKET: *A shiny new stainless steel guard rail has been installed atop the Empire State building to thwart the steady flow of suicides. Sightseeing customers now clearly understand that they are to pay their buck—and only look—please don't overdramatize by jumping.*

○ ○ ○

TABLE I.—*British Empire (excluding Dominions)*

	Country	Tonnage	Assumed price landed in United States	Value landed in United States
			Per unit	
Copper	Rhodesia	25 000	$300	$7,500,000
Lead	Tanganyika	10,000	200	2,000,000
Tin	Malaya	20,000	1,100	22,000,000
Bauxite	Gold Coast	50,000	12	600,000
Do	British Guiana	150,000	12	1,800,000
Manganese	Gold Coast	100,000	35	3,500,000
Chromite	Rhodesia	50,000	35	1,750,000
Do	SierraLeone	20,000	35	700,000
Vanadium (as V_2O_5)	Rhodesia	200	2,000	400.000
Asbestos	do	5,000	75	375,000
Diamonds	West Africa	[1] 500,000	3	1,500,000
Mica	Tanganyika and Rhodesia	200	3,000	600,000
Graphite	Ceylon	1,500	90	135,000
Total annual value				42,860,000

[1] Carats.

TABLE II.—*British Dominions*

	Country	Tonnage	Assumed price landed in United States	Value landed in United States
			Per unit	
Copper	Canada	20,000	$300	$6,000,000
Lead	Australia	15,000	200	3,000,000
Do	Burma	15,000	200	3,000,000
Do	South Africa	15,000	200	3,000,000
Zinc concentrate	Australia	30,000	40	1,200,000
Do	Canada	25,000	40	1,000,000
Do	South Africa	30,000	40	1,200,000
Manganese	India	100,000	35	3,500,000
Do	South Africa	50,000	35	1,750,000
Chromite	do	50,000	30	1,500,000
Nickel	Canada	10,000	650	6,500,000
Tungsten	South Africa	200	1,200	240,000
Do	Burma	1,000	1,200	1,200,000
Platinum metals	South Africa	[1] 10,000	50	500,000
Mica	India	2,000	1,500	3,000,000
Asbestos	South Africa	10,000	100	1,000,000
Total annual value				37,590,000

[1] Ounces.

TABLE III.—*French, Belgian, and Dutch Empires*

	Country	Tonnage	Assumed price landed in United States	Value landed in United States
			Per unit	
Copper	Belgian Congo	20,000	$300.00	$6,000,000
Tin	East Indies	20,000	1,100.00	22,000,000
Do	Belgian Congo	2,500	1,100.00	2,750,000
Lead	Morocco	20,000	200.00	4,000,000
Zinc	Belgian Congo	20,000	160.00	3,200,000
Zinc concentrate	Morocco	30,000	40.00	1,200,000
Bauxite	France	50,000	12.00	600,000
Do	East Indies	100,000	12.00	1,200,000
Do	Surinam	100,000	12.00	1,200,000
Chromite	New Caledonia	15,000	35.00	525,000
Cobalt	Belgian Congo	1,000	3,000.00	3,000,000
Cobalt ore	Morocco	2,000	300.00	600,000
Nickel	East Indies	5,000	650.00	3,250,000
Mica	Madagascar	300	2,000.00	600,000
Graphite	do	2,000	100.00	200,000
Diamonds	Belgian Congo	[1] 500,000	.50	250,000
Tantalum-columbium ore	do	500	600.00	300,000
Total				56,875,000

[1] Carats.

TABLE IV.—*All other*

	Country	Tonnage	Assumed price landed in United States	Value landed in United States
			Per unit	
Tungsten	Portugal	1,000	$1,200	$1,200,000
Mercury	Italy	[1] 4,000	60	240,000
Talc (steatite)	do	1,000	40	40,000
Chromite	Turkey	50,000	35	1,750,000
Copper	do	5,000	300	1,500,000
Cryolite	Greenland	2,000	90	180,000
Total value				4,910,000

[1] Flasks.

Critical Materials May Be Obtained As Price of U. S. Aid

Washington

• • • **Stockpiling** of critical materials, bogged down for the past two years because of scarcities and high prices, is due for a $136 million shot in the arm, if plans of the House Foreign Aid Committee materialize.

This committee, formed last summer to study the reconstruction needs of Western Europe, is preparing recommendations for reverse assistance under the Marshall Plan. "We are pouring out our own resources to aid these countries," the committee believes. "An equivalent guaranty of repayment through stockpiling or participation is only a fair return." This is the gist of its philosophy.

Although U. S. acquisition of $136 million worth of critical materials for stockpiling certainly would be a relatively small amount, the committee points out that the too-heavy depletion of foreign stocks by the U. S. would reduce foreign dollar credits to a dangerous low.

"It would seem foolish to channel the entire import of these strategic materials from the areas named into the field of repayment of any advances for assistance given, because by so doing the current dollar credits which are being earned through normal commercial activities would be reduced and the unfavorable balances of Western Europe further increased," the committee states.

The committee estimates current dollar value of commercial imports from the areas affected to be in the region of $250 million to $300 million. The principal items would be tin from the Far East; nickel, copper, lead and zinc from Canada; manganese, chrome ore and asbestos from South Africa; manganese and mica from India; cobalt and tin from the Belgian Congo, and manganese from the Gold Coast.

"A sound conservation policy, in terms of national defense, would indicate the necessity of heavy imports of all the minerals—fluorspar, copper, zinc, cadmium, lead, bauxite and vanadium—in order to preserve and lengthen the life of our own high-grade ores," the committee believes. Since the U. S. already has imported this year a monthly net average of 20,000 tons of copper, 23,000 tons of zinc and 16,000 tons of lead, and since domestic mine production is running at capacity, it is logical to assume that import requirements will not drop.

The needs of national defense should be paramount over the arguments of domestic producers, the committee feels. "High tariffs have marked the mineral policy of this country in the period since 1930. The same resistance of domestic mining interests applies to the importation of stockpiles that would overhang the market," the group says.

"It therefore needs to be met by the strongest arguments for national defense, supplemented by the fact that such imports constitute one of the few relatively painless ways of accepting payment for loans which we are making to countries that are either themselves producers of these minerals (such as Greece and Turkey) or which have colonies which are heavy producers. It must also be met by keeping our own mineral reserves in a state of readiness for national defense by adequate developmental programs," the committee states. "Such imports need not in any way impede the maintenance of a healthy domestic mining industry."

"It is clear that the annual export of several million tons of steel and possibly a similar amount in the form of machinery of every character cannot but put a drain upon our resources to the degree that domestic minerals are going into these exports. The loss of scrap involves mining still more ore. There is all the more reason for replacing the total export of raw materials that go into these commodities and for getting imports of materials of which we do not possess reserves as a payment in kind and over a long period for whatever aid the Congress may authorize," the committee feels.

The accompanying committee tabulations may serve as a preliminary basis for estimating possibilities of repayment through the stockpiling of strategic minerals.

TABLE V.—*Recapitulation*

Table I.	British Empire (excluding Dominions)	$42, 860, 000
II.	British Dominions	37, 590, 000
III.	French, Belgian, and Dutch Empires	56, 875, 000
IV.	All other	4, 910, 000
	Total	142, 235, 000

TABLE VI.—*Totals by commodities*

Commodity	Unit	Total amount annually	
Asbestos	Ton	15, 000	5,000 each amosite, chrysotile, blue.
Bauxite	do	400, 000	Aluminum equivalent 100,000.
Chromite	do	185, 000	135,000 metallurgical, 50,000 chemical.
Cobalt	do	1, 300	Including 300 tons contained in ore.
Copper	do	70, 000	
Cryolite	do	2, 000	
Diamonds	Carat	1, 000, 000	Largely crushing boart.
Graphite	Ton	3, 500	2,000 crucible grade.
Lead	do	75, 000	
Manganese ore	do	250, 000	Basis 48 percent Mn.
Mica	do	2, 500	2,200 muscovite; 300 phlogopite.
Mercury	Flask	4, 000	
Nickel	Ton	15, 000	
Platinum metals	Ounces	10, 000	
Talc (steatite)	Ton	1, 000	
Tantalum-columbium ore	do	500	Basis 25 percent Ta_2O_3; 20 percent Cb_2O_5.
Tin	do	42, 500	
Tungsten ore	do	2, 200	Basis 60 percent WO_3.
Vanadium oxide	do	200	V_2O_5 basis.
Zinc	do	70, 000	Including 50,000 recoverable content of concentrates.

The above figures are all in short tons except where otherwise noted and except for chrome, bauxite, and manganese, which are in long tons, as is customary in the trade.

In addition, it might be possible to obtain some of the following commodities, but the available data provide little basis for estimating a rate over a 20-year period.

Corundum	South Africa, Portuguese East Africa.
Beryllium ore	India, South Africa, Uganda.
Tantalum ore	Uganda, Australia.
Kyanite	India.
Uranium ores	Canada, Belgian Congo.
Cadmium	Belgian Congo.

Except for uranium, the aggregate value of these materials would not be large in relation to the totals shown.

New Tinplate Prices

New York

• • • **The U. S. Steel Export Co.** has announced a new list of export prices effective Jan. 1, 1948, covering tin mill products with freight included to New York, Philadelphia or Baltimore. The company said these prices are subject to adjustment to sellers' prices in effect at the time of shipment from the mill. All prices are net cash and are as follows:

Tinplate, American coke	1.25 lb coating	107#	$7.76	Base Box
Tinplate, American coke	1.50 lb coating	107#	7.96	Base Box
Tinplate, Ferrostan unassorted	0.25 lb coating	107#	6.96	Base Box
Tinplate, Ferrostan unassorted	0.50 lb coating	107#	7.16	Base Box
Tinplate, Ferrostan unassorted	0.75 lb coating	107#	7.36	Base Box
Special coated manufacturing ternes—unassorted		107#	7.06	Base Box
Manufacturing ternes—unassorted		107#	7.56	Base Box

Canada to Build Buses

Buffalo

• • • **Fleet Mfg. & Aircraft, Ltd.,** will produce aluminum alloy motor buses for the Twin Coach Co. of Buffalo and Kent, Ohio, under a sub-contracting arrangement at Fleet's Ft. Erie (Ont.) plant.

Twin Coach Vice-President John J. Lee said the arrangement would enable Twin Coach to supply buses to a market which had been lost under Canada's "austerity" program.

Fleet will be paid for assembling the buses and some of the fabricating will be done at the Ft. Erie plant, but for the time being the motors, automatic transmissions and various other parts will be shipped from the U. S.

Steel Firm Pitches In To Help Pottery Repair $1 Million Fire Damage

Scio, Ohio

• • • **An Ohio pottery,** half destroyed by a million dollar fire on Dec. 12, will be back in production in January thanks to a steel company's cooperation and an amazing labor-management relationship. Following the fire the townspeople of Scio, Ohio, pitched in to clear the debris from the Scio Pottery, its only industry. Lou Reese, owner of the plant, told his 830 employees their $500,000 Christmas bonus had gone up in smoke but that it would help in rebuilding if he could get structural steel.

The town's mayor, P. M. Getter, was one of the small group who founded the business on a shoestring in 1932. Reese's capital was 11¢ at that time. They built it up to the point where $700,000 in bonuses—some amounting to $3,500—were paid out at Christmas in 1946. When the employees realized this year's bonus would be needed to rebuild the plant they turned the tables by giving the boss a $1,000 bonus at a mass meeting. High fire insurance rates on a plant of that type were said to have been responsible for lack of insurance coverage. Despite this, Mr. Reese stated that the company has sufficient funds to rebuild the plant. His main worry after the fire was steel.

He hadn't bought much steel in the past 15 years. Perhaps he didn't know about the historical allocations system used by steel firms but he did know steel was hard to get. But he probably didn't know that many steel mills hold back allocation of some of their production for emergencies.

On Monday, 3 days after the fire, a Scio citizens' committee met with James A. Henry, vice-president in charge of sales and W. A. Murphy, executive vice-president at Weirton. As a result of their conference the steel company's chief engineer, Clarence J. Klein, went to Scio that day and returned with an estimate of the pottery's steel needs. Also on that same Monday a carload of Stran Steel framing and roofing sheets left Great Lakes Steel's Stran Steel Div. in Detroit, for Scio.

Following Mr. Klein's inspection trip the pottery was assured prompt shipment of 350 tons of structural steel. It is understood that some other steel may be furnished by Weirton. Meanwhile Great Lakes, Weirton's affiliate in National Steel Corp., is planning to ship additional material. There will be one Quonset hut 205 x 220 ft and another 40 x 100 ft. Two or three additional Quonsets will follow, for a total of 60,000 sq ft of buildings.

Structurals not too badly bent will be straightened on the scene by a straightening press shipped from Weirton. The company's Steubenville plant will take all the conveyor chain damaged in the flames and anneal and temper it. To help clear debris and start reconstruction a gasoline powered crane with 65-ft boom was also dispatched, with its operator, from Weirton.

50 YEARS AGO

THE IRON AGE, *December 16, 1897*

• "Capitalists are understood to be looking at Lake Superior, particularly Marquette, as a possible location for an extensive iron and steel industry. Newspapers of Duluth and Superior have for a long time amused themselves and tickled the public by their predictions that early control of such an operation would be taken over by John D. Rockefeller. Mr. Rockefeller is not an iron maker and doesn't want to be. These prophecies are simply ridiculous."

• "The Gipsey combination anvil, vise and drilling machine has been put on the market by Bonney Vise & Tool Works, Philadelphia. It is expected to find wide popularity with farmers."

• "The first Patton motor car built for street railroad purposes was successfully tested at Cedar Falls, Iowa, last week. In the Patton car, motive power is generated by gasoline used to operate the dynamo which works the motors."

• "A new process of brazing is threatening the old-time flame method. This process is liquid brazing. It has recently been demonstrated that a specially treated joint, plunged into molten spelter, would not only braze in a very few seconds but would emerge free from scale, a brisk cleaning with a metal brush being all that is required."

• "Before sailing from New York last week on a tour of the world, George K. Vanderbilt took out a life insurance policy for $1 million with the Mutual Life Insurance Co. This is by far the greatest policy ever issued in the world, and it has created a vast amount of interest among insurance men."

• "One of the serious menaces of late years to business is the growing tendency of State legislatures to interfere with the natural laws of trade. It is usually done under the guise of devotion to the common weal and opposition to monopoly. But the real reasons are a wish to increase the revenues of the state, an unreasoning dislike of corporations, and a desire—borrowed from trades' unionism—to foster local industries regardless of consumer rights."

Packaged Welder Offered

Buffalo

• • • **Westinghouse** Electric Corp. has started production at its Buffalo plant of a new "completely packaged" automatic welding machine which delivers alternating current welding power.

Manager Leon R. Ludwig of the company's Buffalo Divisions said operations with the new machines are 20 to 30 pct faster than with comparable dc apparatus. They are operated with an open-circuit voltage as low as 65 v. and are designed primarily for manual welding.

Gray Market in Nails Target of Program By Government, Producers

Washington

• • • **A three-point** attack on nail shortages and related gray market operations was launched last week as a result of a meeting of nail and steel producers with a subcommittee of the Senate-House Joint Housing committee.

At the meeting, presided over by Senator Flanders, R., Vt., it was decided that the industry should:

(1) Step up nail production, especially of housing sizes, to a 24-hour-a-day, 40-hour-a-week basis;

(2) Provide better policing of distribution operations; and

(3) Take steps to obtain increased rod shipments to non-integrated nail producers.

Senator Flanders said his group had not found the slighest evidence that established mills are profiting from high open-market prices. These profits, he added, are going to fly-by-night operators who seize the opportunity to turn a fast dollar while not actually going outside the law.

Asked by THE IRON AGE whether increased nail production would not divert steel from other production, Flanders said the overall effect would be negligible. Only a very slight shift in present rod allocations would be necessary to provide full needs for the nail industry.

Dim hope was held out for an overall 12 pct increase in current production which some believe would overcome the shortage. Also, it was the majority opinion that restoration of subsidies would have little effect in raising output.

In this respect, it was pointed out by major producers that their current output was already running from 14 to 47 pct above prewar production. For instance, Republic Steel, which has the third greatest number of nail machines, said it was running at capacity except in Chicago, where housing and manpower is a factor, with output 28 pct above any previous peacetime year.

Likewise, American Steel & Wire Co. said it was already operating on a three-shift basis which has raised its production about 18 pct above both 1940 and 1946 output.

Sends Alternate Bill On Inflation to The White House for OK

Washington

• • • **Congress passed** and sent to the White House legislation (SJ Res. 167) authorizing industry to enter into voluntary allocation agreements under suspension of the anti-trust laws.

The bill represents Congressional denial of President Truman's request for mandatory allocation powers. Republicans and Democrats alike supported the Taft-Wolcott proposal which would permit the making of voluntary agreements and extends export controls to Feb. 28, 1949.

In House debate, Chairman Wolcott, R., Mich., of the Banking and Currency Committee, charged that Democratic amendments designed to make the controls mandatory would result in "socialization" of the economy. "How many constitutional Democrats can vote for such a proposal," he said.

Specifically, the bill authorizes the President to confer with industry and agriculture with a view to entering into voluntary agreements to:

(1) Provide priority allocation and inventory control of steel and other "scarce commodities which basically affect the cost of living or industrial production."

(2) Provide for allocation of transportation facilities and equipment.

(3) Provide for regulation of speculative trading on commodity exchanges.

All such agreements would expire Mar. 1, 1949, and price-fixing agreements, under the proposal, are outlawed. Antitrust laws would be suspended for the duration of such agreements.

The bill also provides that when the President finds any raw material, commodity or product in critically short supply, he may ask Congress to enact further conservation measures. Such a request would have to include specific proposals for a degree of curtailment.

In Senate debate on the measure, Senator Taft, R., Ohio, charged that amendment of the bill to permit mandatory allocations would "give the President complete power to shut down an industry if he wished to do so or to limit its operations."

Senator Morse, R., Ore., called attention to the political nature of the compromise bill, charging that Senate debate had been "characterized by principles of political strategy." He added: "All I can say is that I want to express my deep regrets over the program. I think it represents a great mistake on the part of the Republican Party."

Kaiser Gets Chance On Provo Blast Furnace

Provo, Utah

• • • **The Kaiser-Frazer Corp.** has made a 1 pct down payment to WAA on the full purchase price of $1,150,000 for the blast furnace transplanted from Joliet, Ill., to Provo in 1942.

The above price includes the furnace and 500 beehive coke ovens with capacity of 800 tons per day. Sale is conditional upon the solution of problems involved in supplies of iron ore and coal, water, power and transportation.

This furnace has been considered a lemon by the steel industry and was given up as a bad job by U. S. Steel Corp. during the war when it failed to function with the then available locally produced coke.

Dr. Walther Mathesius, president, Geneva Steel Co., WAA, RFC, and various others interested in the project have pledged to support the overcoming of the obstacles involved in placing the furnace back in blast.

Albany Chapter Added To Foundrymen's Assn.

Chicago

• • • **American Foundrymen's** Association has authorized the formation of its 39th chapter, with headquarters at Albany, AFA secretary-treasurer William W. Maloney has announced.

Industrial Briefs . . .

• REOPENS MINE—The Redding Ore Mine near Birmingham of Woodward Iron Co. will be reopened after being closed down since 1927. The company estimated that 6 months will be required to put the mine in condition.

• MILLER TAKES OVER—Colonial Industries, Inc., Bessemer, Ala., has been purchased by the Miller Foundry, Birmingham. Iron castings for farm implements will be made at the Bessemer plant.

• REPRESENTATIVE — Marion Power Shovel Co. of Marion, Ohio, has announced the appointment of W. F. Lanius as sales representative at Portland, Ore., with headquarters at 2505 NE 33rd Ave.

• BUYS MACHINERY FIRM — Hartford-Empire Co., Hartford, glass making machinery, has purchased the Standard-Knapp Corp., Portland, Conn., manufacturers of machinery for containers. Purchase price was $4 million.

• GROUP ELECTS SYKES — Wilfred Sykes, president of Inland Steel Co., has again been nominated president of the Chicago Assn. of Commerce and Industry.

• ACHESON EXPANDS — New manufacturing and laboratory facilities have been placed in operation by the Acheson Colloids Corp. of Port Huron, Mich.

• DEMA ELECTS OFFICERS — Gordon Lefebvre, president of the Cooper-Bessemer Corp., was elected the new president of Diesel Engine Manufacturers Assn. Otto H. Fischer, president of the Union Diesel Engine Co., and L. W. Metzger, vice-president of the Baldwin Locomotive Works, were elected new vice-presidents of DEMA.

• NEW PLANT — Rust-Oleum Mfg. Co., Evanston, Ill., manufacturer of rust preventives and paints and varnishes, is constructing a new plant adjacent to its present location. The project calls for three buildings, and space for new offices.

• OPENS RESEARCH CENTER — The Jeffrey Mfg. Co., Columbus, Ohio, has recently completed a research center. It is equipped to perform tests of sufficient scope to insure accurate predetermination of field results, also the construction of experimental and pilot plant equipment.

• FURNACES AND OVENS—Industrial heat treating furnaces and ovens which cost the government $267,513 will be placed on sale at fixed prices by WAA in January. The sale opens to federal agencies Jan. 5, to veterans of World War II on Jan. 6, and to commercial buyers, Jan. 14.

• IMPROVING PLANT—The Colorado Fuel & Iron Corp. is spending $700,000 on improvements to its Wickwire Spencer Steel Div. plant in Buffalo. Of this sum, half is to rehabilitate and return to operation its second blast furnace, and the other $350,000 for four new steam boilers.

• INCREASING CAPACITY—Acme Steel Co. is currently making large additions to its capacity for rolling strip steel in its principal plant at Riverdale, Ill.

• NEW COKE OVENS — Youngstown Sheet & Tube Co. plans to install a new battery of 75 coke ovens at its Indiana Harbor plant in East Chicago, Ind. They will also rebuild the No. 1 blast furnace at the same plant, increasing its capacity from 800 tons to 1400 tons daily.

• MHA ELECTS OFFICER — Ray Perin, Ira G. Perin Co., for 35 years west coast representative for Elwell-Parker trucks, has been elected president of the Materials Handling Assn. of Northern California.

Canadian Pig Iron Production During October Decreased

Toronto

• • • **Canadian pig iron** production dipped slightly in October to 163,335 net tons, or an average of 71.4 pct of total rated capacity and compares with 169,630 tons in September when the rate was 74.1 pct, and with 74,958 tons in October 1946 at which time output was sharply reduced by strikes at the three major steel plants.

Output for the month under review included 133,179 tons of basic iron of which 129,796 tons were for further use of producing companies and 3383 tons for sale; 14,577 tons of foundry iron with 222 tons for further use and 14,355 tons for sale, and 15,579 tons of malleable iron, all for sale.

Charges to blast furnaces in October included 295,420 tons of iron ore, 19,224 tons of mill cinder, scale, sinter, etc., and 3557 tons of scrap iron and steel. At the end of the month 11 furnaces were in blast and 3 blown out of a total of 14 furnaces in Canada.

For the 10 months ended October 31, Canada's output of pig iron totaled 1,630,149 net tons, as compared with 1,107,025 tons in the like period of 1946 and with 1,566,504 tons in 1945.

For October, production of ferroalloys amounted to 14,691 net tons, against 11,152 tons in September and 8448 tons in October, last year. Output for the month under review included ferrosilicon, silicomanganese, ferromanganese, ferrochrome, chrom-x and ferrophosphorus. For the first 10 months this year production totaled 127,393 net tons as compared with 95,859 tons in the 1946 period and 154,757 tons in 1945.

Following are comparative monthly production figures for pig iron and ferroalloys in net tons:

	Pig Iron	Ferro-Alloys
January	177,313	9,544
February	150,632	9,357
March	164,403	14,197
April	160,749	13,015
May	160,230	15,325
June	159,826	16,212
July	157,153	12,402
August	166,878	11,398
September	169,630	11,152
October	163,335	14,691
Total 10 months	1,630,149	127,393

Weekly Gallup Polls . . .

Public Favors Stopping Shipment of Goods to Russia

Princeton, N. J.

• • • **Demands in Congress** for full information about the extent of our lend-lease shipments to Russia are closely in tune with American public attitudes, according to George Gallup, director, American Institute of Public Opinion.

Whatever reason the State Dept. has for lend-lease exports to Russia—such as the fact that we import useful material from Russia or the need to encourage normal trade—those reasons have not been presented effectively to the general public.

A substantial majority of voters react unfavorably, to the idea of our government shipping such products as oil, machinery and industrial items to the Soviets while we are being called upon to help check communism in Europe by supporting the Marshall Plan.

Harold E. Stassen, former Minnesota governor and a candidate for the 1948 GOP presidential nomination, declared recently that in 1947 the United States shipped Russia more electrical machinery and apparatus than to England and France combined. He urged a ban on exports of heavy machinery or potential war materials to the Soviets.

The country's attitude toward the issue was probed in a survey conducted just prior to the Congressional questioning which prompted the current publicity on our Russian exports. From coast-to-coast voters were asked two questions. The first was designed to find out how many American voters think goods are being shipped by our government to Russia. The findings reveal that about half did not know they were.

"Do you happen to know whether the United States government is now shipping oil, machinery and industrial products to Russia?"

	Pct
Yes, it is	52
No, it isn't	48

The second question, asked of everyone in the sample, was:

"Would you like to see the United States government stop shipments of oil, machinery and industrial products to Russia or should we continue to send these things to Russia?"

	Pct
Stop	71
Continue	16
Qualified	6
No opinion	7

The principal qualified answers were "Stop until Russia is more cooperative," "send shipments only after we find out how they are being used" and "send a minimum of goods."

•

Recent Elections Held in Five Nations Indicate a Trend Of Moving Toward Conservatism

° ° °

• • • **In the diplomatic** struggle between the United States and Russia there is increasing evidence that conservative forces throughout the world are gaining strength. World opinion, judging by recent elections in five countries, is moving toward the right, not toward the left.

Although leftist parties in many nations have been excoriating the Marshall Plan and condemning alleged American "imperialism," elections in France, Denmark and Finland during the past few weeks show right-wing sentiment gaining. To the extent that the United States represents a symbol of conservatism in the eyes of other nations, American policy in Europe as reflected by the Marshall Plan seems to be making headway.

The most recent election to reflect opinion on the American-Russian struggle was that in Finland held on Dec. 4 and 5. The latest count shows the Finnish Communist party losing some 300 offices in rural districts and cities.

In another Scandinavian country, Denmark, a general election held Oct. 27 showed a 6 pct drop in Communist party strength as compared to the last election in 1945.

In the French municipal elections, which precipitated a strike crisis ending in a setback for the French Communists, there was a marked gain of conservative forces. The new de Gaulle party polled nearly 40 pct of the vote, picking up votes at the expense of all other parties. The Communist vote dropped from 5,500,000 to 4,700,000. The outcome of the election has been widely interpreted as a rallying of conservative forces which were formerly divided.

While elections in Britain and in Australia showed no reflection of opinion concerning American-Russian relations, they did indicate some shift of sentiment toward the right.

England had four by-elections for parliamentary seats between Nov. 26 and Dec. 5. While the Labor Party retained its seats, it suffered losses in terms of popular votes. The Conservative party enjoyed gains that were substantial in some districts.

The Labor Party losses ranged from approximately 1 pct to 6 pct in the four districts. Conservatives gained from 1 to 12 pct, part of the gain coming from the Liberal Party in certain areas.

In Australia, a state election was held in Victoria on Nov. 8, which resulted in a loss of 16 parliamentary seats for the Labor Party, two for the Independents, and a gain of 18 seats for the Liberal-Country party.

Local conditions and issues were, of course, a factor in all of the above elections in the various countries. But it does seem significant that in five widely separated nations within a few weeks' time there was a consistent loss of voting strength by left-wing or liberal parties.

Construction Steel . . .

New York

• • • According to reports received by the American Institute of Steel Construction, the estimated total bookings of fabricated structural steel for the first 11 months of the year have totaled 1,473,205 tons or 7.8 pct increase over the same averaged months in the 5 prewar years 1936 to 1940. November bookings amounted to 126,264 tons.

November shipments totaled 153,875 tons. Shipments for the first 11 months totaled 1,704,832 tons, an increase of 26.9 pct over the same months in the prewar years.

The tonnage available for fabrication as of Nov. 30 was 645,440 tons.

Following is the complete tabulation of bookings and shipments:

	Estimated Total Tonnage for the Entire Industry 1947	Estimated Total Tonnage for the Entire Industry avg. 1936-1940
Contracts Closed		
January	104,973	107,578
February	125,881	96,280
March	149,634	124,558
April	161,338	110,783
May	112,954	126,237
June	103,273	125,835
July	153,540	152,481
August	146,382	113,135
September	134,630	137,982
October	154,336*	141,557
November	126,264	129,757
Total	1,473,205	1,366,183
Shipments		
January	140,650	92,578
February	136,126	88,626
March	137,799	115,031
April	157,392	123,650
May	154,980	123,225
June	151,882	129,969
July	169,911	127,422
August	157,952	136,389
September ...	164,345	137,255
October	179,920*	140,944
November	153,875	127,873
Total	1,704,832	1,342,962
Tonnage available for fabrication within the next 4 months	645,440	350,268

* Revised.

• • • **Fabricated steel awards this week included the following:**

1700 Tons, Washington, DuPont Circle underpass, to Bethlehem Steel Co., Bethlehem.

1625 Tons, Birmingham, city hall for City of Birmingham, to Virginia Bridge Co., Birmingham.

470 Tons, Philadelphia, Merion Plaza apartments, to Bethlehem Steel Co., Bethlehem.

400 Tons, Chicago, Vandercook Mfg. Co. building to A. L. Jackson, contractor.

325 Tons, Saratoga, Wyo., bridge F 1740-1 State of Wyoming to Kansas City Structural Steel Co., Kansas City, Kan.

170 Tons, Chicago, building for the American Weekly Inc., through Carroll Construction Co. to Hansell Elcock.

150 Tons, Philadelphia, substructure for Penrose Ave. bridge, City of Philadelphia, to Foley Bros., New York.

100 Tons, Butte County, S.D., Bell Forshe bridge. F 206-9 Northwestern Engineering Co., low bidder.

100 Tons, Philadelphia, Chase Brass & Copper Co. office and warehouse building, to Bethlehem Steel Co., Bethlehem.

• • • **Fabricated steel inquiries this week included the following:**

950 Tons, Pittsburgh, Sears Roebuck & Co., due Dec. 26.

780 Tons, Indianapolis, Michigan Street bridge to U. S. Engineers, Louisville office, to be bid Jan. 8.

660 Tons, Los Angeles, filter, drier and fertilizer storage system, Hyperion activated sludge plant, Los Angeles Board of Public Works, bids to Jan. 21.

450 Tons, Elizabeth, N. J., Sears Roebuck & Co., due Dec. 26.

450 Tons, Camden, N. J., New Jersey Dept. of Highways, due Dec. 30.

285 Tons, Tacoma, Wash., bridge construction, etc., Puyallup River, Seattle District, Corps of Engineers, Serial No. W-45-108-eng-48-30, bids to Jan. 7.

225 Tons, State Colege, Pa., General Foods building, bids in.

200 Tons, Wilmington, Del., Veterans' Administration hospital, due Jan. 30.

• • • **Reinforcing bar awards this week included the following:**

3265 Tons, San Francisco, substructure for Mission Rock Terminal, through Clinton Construction Co. to Soule Steel Co., San Francisco.

1000 Tons, Grand Island, Neb., veterans' hospital through U. S. Engineers Omaha office. Lovering Construction Co. and Carlson Construction Co. combined bid was low.

430 Tons, San Bernardino, Calif., water reservoir at Waterman Ave. and Marshall Blvd., through Baker Construction Co. to Truscon Steel Co., Cleveland.

140 Tons, Granite City, Ill., telephone building, to Laclede Steel Co. through S. M. Wilson Construction Co., Granite City, general contractors.

• • • **Reinforcing bar inquiries this week included the following:**

1600 Tons, Cambridge, Neb., Medicine Creek Dam, through U. S. Engineers, bids closed Dec. 23.

640 Tons, Los Angeles, filter, drier and fertilizer storage system, Hyperion activated sludge plant, Los Angeles Board of Public Works, bids to Jan. 21.

480 Tons, Clayton, Mo., courthouse, H. B. Deal & Co., St. Louis, general contractors.

• • • **Piling inquiries this week included the following:**

3000 Tons, Gary, Ind., dock for Unversal Atlas Cement Co. Buffington plant.

Scrap Institute of New Jersey Elects Officers

Washington

Plainfield.

• • • **Emanuel J. Moskowitz** of Schiavone-Bonomo Corp., Jersey City, was elected president of the New Jersey chapter of the Institute of Scrap Iron & Steel, Inc., recently. Mr. Moskowitz succeeds Abe Goldberg, Harry Goldberg & Sons, Perth Amboy, N. J., and will become a member of the national board of directors of the institute.

Other officers who were elected include: First vice-president, George Rubine, Hudson Iron & Metal Co., Bayonne, N. J.; second vice-president, Henry Fiestal, Paterson Compressed Steel, Paterson; third vice-president, Paul Giordano, Giordano Iron & Metal Co., Trenton, N. J.; secretary, Murray Kunin, Schiavone-Bonomo Corp., Jersey City; treasurer, Elie Bussel, Plainfield Iron & Metal Co., Plainfield, N. J.

Coming Events

Dec. 26-31 American Assn. for the Advancement of Science, annual meeting, Chicago.

1948

Jan. 12-16 Society of Automotive Engineers, annual meeting, Detroit.

Jan. 12-16 National Materials Handling Exposition, Cleveland.

Jan. 18-20 Stoker Institute of Canada, annual meeting, Mount Royal Hotel, Montreal, Canada.

Jan. 19-20 Institute of Scrap Iron & Steel, Inc., annual convention, Chicago.

Jan. 21-24 American Society of Civil Engineers, annual meeting, New York.

Feb. 10-11 Pressed Metal Institute, annual meeting, Buffalo.

Feb. 15-19 American Institute of Mechanical Engineers, annual meeting, New York.

Mar. 3-5 Society of Automotive Engineers, national passenger car meeting, Detroit.

Mar. 15-19 ASTE Industrial Exposition, Cleveland.

Mar. 18-19 Magnesium Assn., annual meeting, New York.

Apr. 5-8 Southern Machinery and Metals Exposition, Atlanta.

Apr. 5-8 National Assn. of Corrosion Engineers, annual conference and exhibition, St. Louis.

Apr. 12-14 Openhearth Steel Committee and Coke Oven, Blast Furnace and Raw Materials Committee, AIME, annual conference, Pittsburgh.

River Radar Promises Faster Tows for Mills and Fabricators

Sets Slash 50 Pct From Time Usually Lost in River Fogs Around Pittsburgh

Pittsburgh

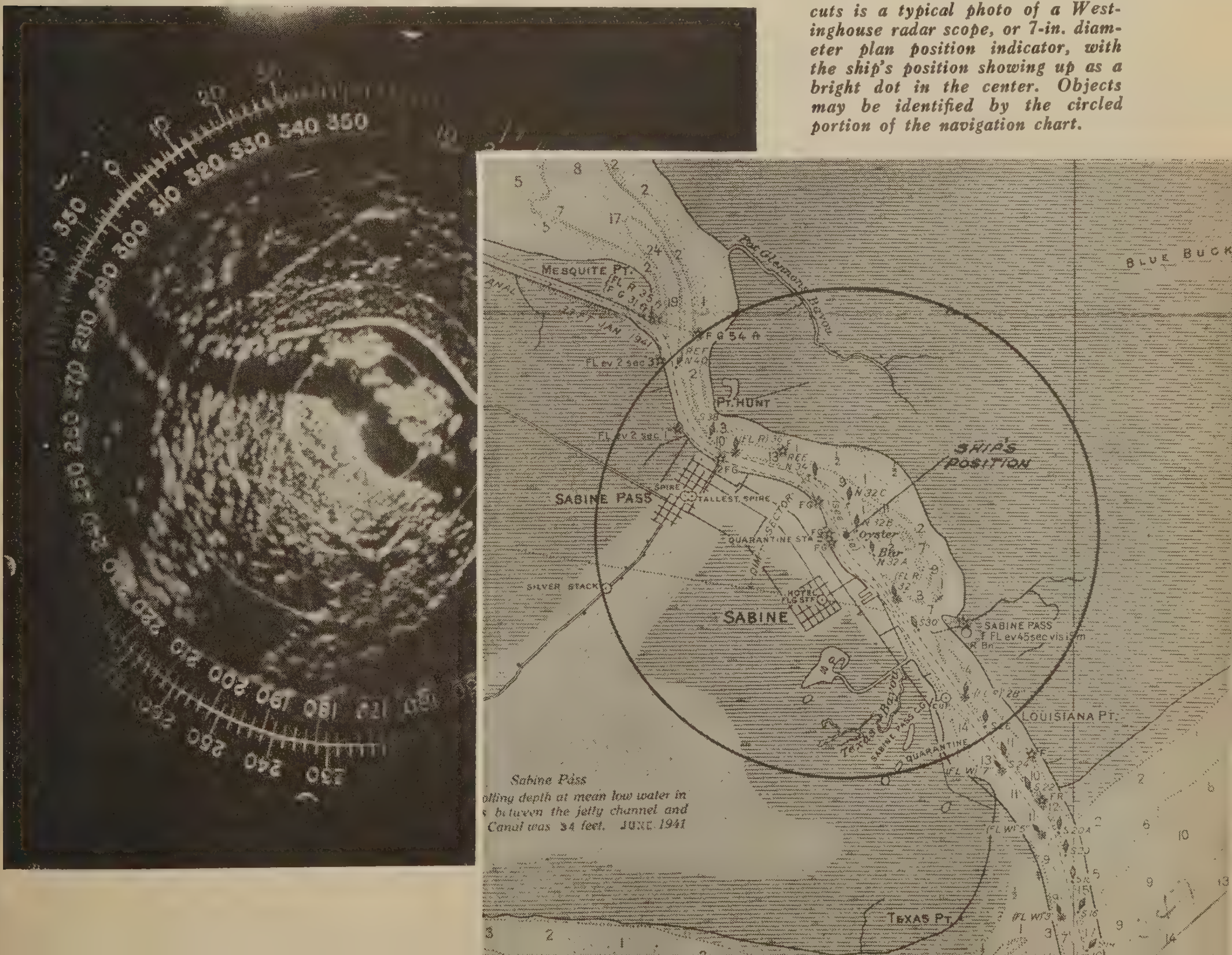
• • • **Radar may soon** pay off for steel mills and their customers on the inland waterways. U. S. Steel has a radar equipped towboat in operation and Jones & Laughlin is reported to be experimenting with one. Keystone Div. of Dravo Corp. reports promising results from operations of their radar equipped boat. These are the only known installations in the Pittsburgh area but about 17 other ships have the new equipment in service farther down the rivers.

Fog is the reason, of course. River pilots say that in a year they lose 5 pct of their running time due to fog around Pittsburgh. During the foggy season this time loss may run to 50 pct in a single week. August through September are the worst months. According to statements at a recent towboat operators' meeting in St. Louis, about half of the fog time loss can be picked up by radar navigation.

Radar doesn't permit full speed operation on fogbound rivers. But each hour lost on a tow is said to cost about $40, not counting loss on the cargo. Aside from towboat time loss, savings may come from three other directions: (1) Finished steel shipments can get through faster—fog-caused loss of 3 or 4 days on a half million or million dollar steel shipment to the West can't be calculated exactly, but it's there; (2) steel and barge companies may find they can do the same job with fewer barges; (3) coal stocks at steel mills and other plants could run lower if deliveries were more certain in foggy weather.

The U. S. Coast Guard uses radar equipped ships in this area and is putting out special buoys for radar navigation. The Army's Corps of Engineers is mapping the Ohio River from Pittsburgh to Cairo, Ill., by radar. When they're through, river pilots will have a complete set of radar charts. These will correspond with the picture the pilot sees at any given point in his radar scope. They may be drawn in ink activated by ultraviolet light to avoid glare at night on the bridge.

To those familiar with wartime radar the river boat models look like toys. They are simple to operate; no technical skill is required.


MESQUITE PT.
PT. HUNT
SHIP'S POSITION
SABINE PASS
TALLEST SPIRE
QUARANTINE STA
SILVER STACK
SABINE
SABINE PASS
LOUISIANA PT.
TEXAS PT.
BLUE BUCK
Sabine Pass
Texas Bayou
QUARANTINE
Oyster Bar
Sabine Pass
...olling depth at mean low water in
...between the jetty channel and
Canal was 34 feet. JUNE 1941

RADAR EYE: *The darker of these cuts is a typical photo of a Westinghouse radar scope, or 7-in. diameter plan position indicator, with the ship's position showing up as a bright dot in the center. Objects may be identified by the circled portion of the navigation chart.*

But friends of Mark Twain need have no fear. For according to a spokesman for Dravo's Keystone Div., the skipper who steers by radar must know his river better than the average. This division operates the Wm. Pitt, which is equipped with a Westinghouse 3 cm MU marine radar especially designed for river use. This type set doesn't clutter up its scope with ordinary rain and snow. It will, however, show an approaching storm and give a pilot time to tie up and wait it out to avoid treacherous currents.

Radar need not be used for a long distance navigating job. Often it merely gets a boat through patches of fog that might otherwise force a tieup. River pilots generally run through fog unless the visibility is exceptionally bad. To an operation that is just possible the radar offers additional security to the man at the wheel: He can spot approaching vessels and double check his eyesight on river banks.

Another advantage claimed by Westinghouse for the 3 cm wave length set is ability to pick up objects close as 100 yd to the set. This means the navigator can usually see the front end of the barges he is pushing. It helps him line up in entering locks or going through narrow channels. Westinghouse does not presently guarantee it but it is understood that objects only 200 ft away are visible in the scope.

Five companies make marine radar sets: General Electric, R.C.A., Raytheon, Sperry and Westinghouse. Prices, installed, are roughly $9000 to $15,000. Of this, installation cost is between $1000 and $3000.

Operators report two objections to present radar sets in river use. They will not pick up bridge abutments or some lock entrances on their scopes. The Coast Guard and Army Engineers have tried various tricks to lick this problem but set manufacturers admit there is nothing right around the corner to indicate they can overcome it. The difficulty is that the mass of steel in bridges makes a heavy line on the scope, shutting out any chance of seeing the abutments.

A Dravo spokesman told THE IRON AGE that they were not finding this a serious obstacle to navigation in fog. The company has equipped the Wm. Pitt with an intercom system, a Webster Teletalk. This connects the front of the tow with the pilot house. The mate on the bow is about 100 yd closer to abutments or locks than the pilot. Unless the fog is extremely dense he can talk the tow through.

Task Committee Will Investigate Expected Oil, Coal Shortages

Washington

• • • A 10-man task committee has been named by the Oil and Coal Shortage subcommittee, Senate Interstate and Foreign Commerce Committee, to look into and report on expected shortages and recommend means of combatting them. Lack of steel for new wells and adequate transportation were listed as major problems.

Named to the advisory group were R. G. Dunlop, president, Sun Oil Co.; B. Brewster Jennings, president, Socony-Vacuum Oil Co.; M. J. Rathbone, president, Standard Oil Co. of N. J.; Reid T. Westmoreland, Jr., Lampson Oil Co.; John W. Scott, Buckley & Scott Utilities; John P. Birmingham, president, White Fuel Corp.; J. C. Richdale, vice-president, Colonial Beacon Oil Co.; James P. Patterson, Pan American Petroleum & Transport; Martin Ryan, and Clyde C. Morrill, executive director, Ind. Oil Men's Assn. of New England.

Announce Two Dividends

Middletown, Ohio

• • • Directors of American Rolling Mill Co. have declared a 20 pct common stock dividend payable on or before Feb. 15, 1948, to stockholders of record Dec. 29, 1947, according to an announcement by president Charles R. Hook. Mr. Hook also announced regular quarterly dividend of $1.12½ per share on the 4½ pct cumulative convertible preferred stock, payable Jan. 15, 1948, to shareholders of record Dec. 15, 1947.

DEMPSTER DUMPSTER
BUCKET-X
BUCKET-X
THE DEMPSTER-DUMPSTER SYSTEM OF MATERIALS HANDLING not only permits the use of any number of detachable bodies to be serviced by one truck hoisting unit, but you can have any special type of body you need to meet your particular requirements to do the job quicker, easier and at far less cost. Many different types of bodies, four of which are pictured at left, are built for handling every conceivable type of materials from light, bulky to extremely heavy, as well as for liquid or dust. Capacities 1½ to 10 cu. yds. and up to 8 Tons pay load.

DEMPSTER DUMPSTER
TRADE MARK REG.

DEMPSTER BROTHERS, INC.
8127 Springdale, Knoxville 17, Tennessee

NOW . . . the smoothest AC Crane Control ever known . . . the new P&H MAGNETORQUE

Excels the speed regulation of DC dynamic braking

● Another great P&H Added Value! Now you may have smooth control and less maintenance combined with the convenience and lower cost of AC power. This new type crane control excels the speed load characteristics of any other AC control system. Provides fine speed control under light as well as full loads.

Eliminates Mechanical Load Brake

The P&H Magnetorque is a simple unit which transmits braking forces electromagnetically. It replaces the mechanical load brake, eliminates friction and wear. It lasts the life of the crane.

It's another outstanding P&H advancement in the interests of better crane service. Don't overlook this and other important P&H Added Values on your next overhead crane. Get the facts about it.

P&H

OVERHEAD CRANES

4401 West National Avenue
Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION

ELECTRIC CRANES • EXCAVATORS • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS

P&H
MAGNETORQUE
CRANE
CONTROL

Bulletin C-39 gives full information about the new P&H Magnetorque Crane Control, along with comparative speed-load curves. A copy is yours for the asking.

What can be done with COLD FORGING and supplemental operations?

ASK MILFORD!

EXAMPLE: Small part formerly screw-machined

MILFORD COLD FORGING SAVED 161 LBS OF BRASS PER 1000 PIECES!

Eye-opener savings! As high as 67% not uncommon. 25% to 40% an every day occurrence. Milford equipment for cold-heading — and experience — are unsurpassed; have cut costs for others, can cut costs for you.

Since many parts now screw machined can be cold-headed, why not investigate? First step: send sample part or fastener. Milford engineers will carry on from there. No obligation.

THE MILFORD RIVET & MACHINE CO.

863 Bridgeport Ave.
MILFORD, CONN.

1006 West River St.
ELYRIA, OHIO

Inquiries may also be addressed to our subsidiary:
THE PENN RIVET & MACHINE CO., PHILADELPHIA 33, PENNA.

If you have a SPECIAL PROBLEM

in any of these operations, where precision work is demanded and where greater production at man-hour savings is paramount—

• BORING—rough, semi-finish and finish • MILLING (special types) • STRAIGHT LINE DRILLING • UNIVERSAL ADJUSTABLE SPINDLE DRILLING • HONING • TAPPING • REAMING • COUNTERBORING • VERTICAL AND WAY-TYPE EQUIPMENT . . .

then a Moline Multiple Spindle Specially Designed machine tool is your answer. Moline tools are ruggedly built and engineered to fit your PARTICULAR requirements, they're made to last for years, they're easy to change over to other jobs, they do better work at less cost and stand up to it longer.

For YOUR special problem, go "HOLE-HOG," write us for any information you may need.

MOLINE
MOLINE TOOL CO. HOLE-HOG MOLINE, ILLINOIS

MOLINE TOOL COMPANY
100 20th Street
Moline, Illinois

Metal Product Tariff Listing Is Continued; Taking Effect Jan. 1

Washington

• • • **The complete listing of old and new tariff rates negotiated at Geneva to become effective Jan. 1 on metals and metal products is continued on this and the following page. The listing was begun on page 115 of the Dec. 18 issue of THE IRON AGE, and will be continued in forthcoming issues. The listing follows:**

Tariff Act
1930; par. No. Description—Rate

324 Wheels for railway purposes, and parts thereof, iron and steel, and steel-tired wheels for railway purposes, wholly or partly finished, and iron or steel locomotive, car, or other railway tires and parts thereof, wholly or partly manufactured:
Old rate 1¢ lb; new rate ½¢ lb.

327 Cast iron pipe of every description, cast iron fittings for cast iron pipe:
Old rate 15 pct ad valorem; new rate 10 pct ad valorem.

327 Cast iron andirons, plates, stove plates, sadirons, tailers' irons, hatters' irons, not including electric irons, and castings and vessels wholly of cast iron, including all castings of iron or cast-iron plates which have been chiseled, drilled, machined, or otherwise advanced in condition by processes or operations subsequent to the casting process but not made up into articles, or parts thereof, or finished machine parts:
Old rate 10 pct ad valorem; new rate 10 pct ad valorem.

327 Castings of malleable iron not specially provided for:
Heel and other plates for boots and shoes:
Old rate 10 pct ad valorem; new rate 5 pct ad valorem.
Other:
Old rate 20 pct ad valorem; new rate 10 pct ad valorem.
NOTE: The existing customs classification treatment of castings of malleable iron which are heel or other plates for boots and shoes, containing leather pegs or plugs, as being provided for in par. 327, Tariff Act of 1930, in accordance with the decision of the U. S. Customs Court published as C.D. 787 (11 Cust. Ct. 30) shall be continued during the effective period of this Agreement.

327 Molders' patterns, of whatever material composed, for the manufacture of castings:
Old rate 25 pct ad valorem; new rate 12½ pct ad valorem.

328 Lap welded, butt welded, seamed, or jointed iron or steel tubes, pipes, flues, stays, not thinner than 0.065 in.:
If not less than ⅜ in. diam:
Old rate ¾¢ lb; new rate ⅜¢ lb.
Less than ⅜ and not less than ¼ in. diam:
Old rate 1¼¢ lb; new rate ⅝¢ lb.
Less than ¼ in. diam:
Old rate 1 ¾¢ lb; new rate ⅞¢ lb.
Provided: That no tubes, pipes, flues,

No. 77 of a Series of Typical Installations

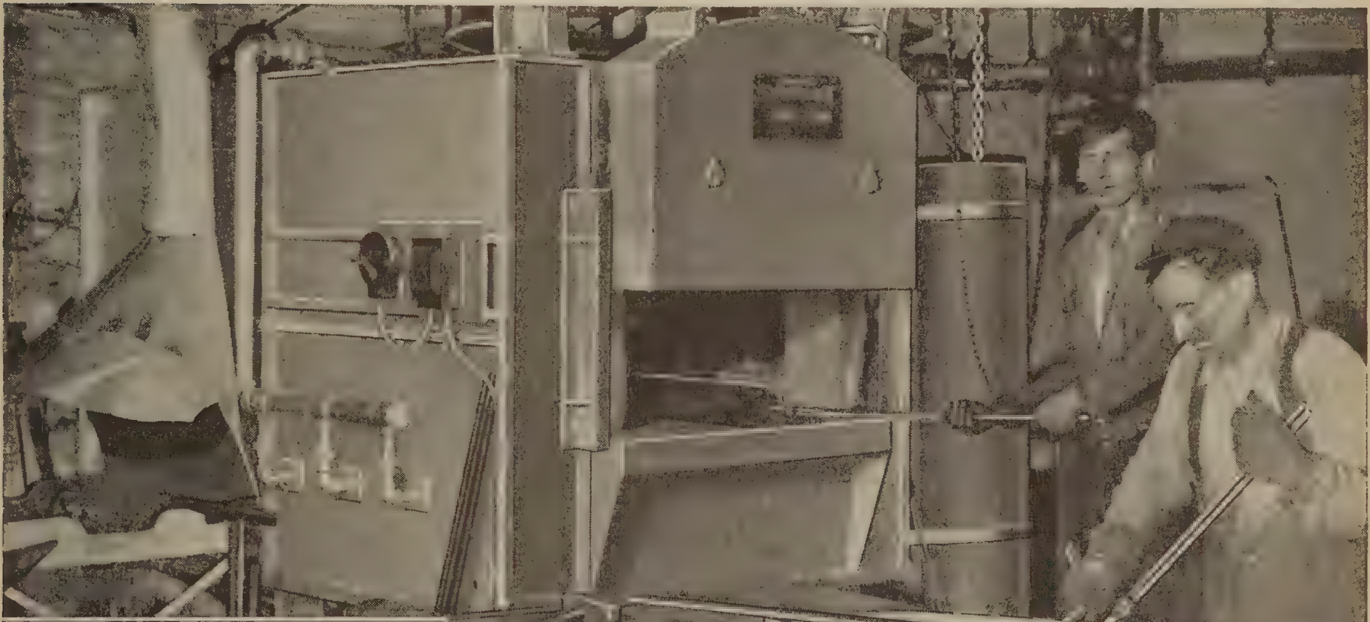
Sunbeam

STEWART

THE BEST INDUSTRIAL FURNACES MADE

For REPAIRING and FABRICATING HEAVY-DUTY SPRINGS

AT ATLAS AUTO SPRING CO., BROOKLYN, N. Y.



Unloading the Standard Sunbeam Stewart Heavy Portable Oven Furnace in use at Atlas Auto Spring for heat treating heavy-duty spring leaves. Designed for 1400°-1800° F. operation, these units are also available for operation up to 2200° F.

For over 16 years, Atlas has been using this Sunbeam Stewart Forge Furnace as a supplementary shop furnace. Its simple, yet highly efficient design required little maintenance through the years—another example of Sunbeam Stewart's high quality furnaces, incorporating correct design and good workmanship.

Specializing in repair and replacement of heavy-duty leaf springs used on semi-trailers, milk and oil tank cars, coal trucks, etc., Atlas required the most accurate heat treating equipment for their fabrication. Using a standard Sunbeam Stewart Semi-Muffle Heavy Portable Oven Furnace, they have produced springs with enough flexibility to absorb road shock, yet rugged enough to withstand the fatigue of abnormal deflections.

Close temperature control and even heat distribution throughout the entire heating chamber is made possible by the Sunbeam Stewart design.

The large door opening—the entire width of the furnace heating chamber—facilitates loading and allows the heat treating of large assemblies. The usable hearth area is 18 sq. ft.

The installation at Atlas was designed for 1400° to 1800° F. operation. However, these furnaces are available for operating temperatures up to and including 2200° F.

This installation demonstrates the versatility of standard Sunbeam Stewart Furnaces. In addition, Sunbeam Stewart builds completely automatic units to meet specific production requirements.

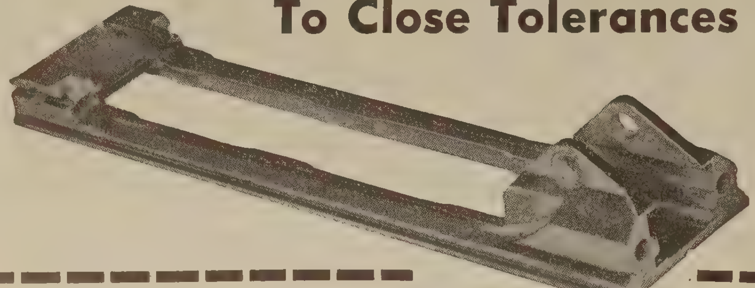
SUNBEAM STEWART INDUSTRIAL FURNACE DIVISION of SUNBEAM CORPORATION

(*Formerly* CHICAGO FLEXIBLE SHAFT CO.)

Main Office: Dept. 110 4433 Ogden Ave., Chicago 23—*New York Office:* 11 W. 42nd St., New York 18—*Detroit Office:* 308 Boulevard Bldg., Detroit
Canada Factory: 321 Weston Rd., So., Toronto 9

A letter, wire or 'phone call will promptly bring you information and details on SUNBEAM STEWART furnaces, either units for which plans are now ready or units especially designed to meet your needs. Or, if you prefer, a SUNBEAM STEWART engineer will be glad to call and discuss your heat treating problems with you.

PRECISION PRODUCTS
To Close Tolerances



As a result of its wartime activities in manufacturing gun-parts, which brought the Army-Navy Award with three stars, the Hendrick plant now has surplus facilities available for making small to medium size precision products to close tolerances.

In fact, it is a common procedure for Hendrick's experienced machine tool operators to work to a tolerance of .0005 inches.

If you will submit specifications and samples of products on which you wish quantity prices, we will quote promptly.

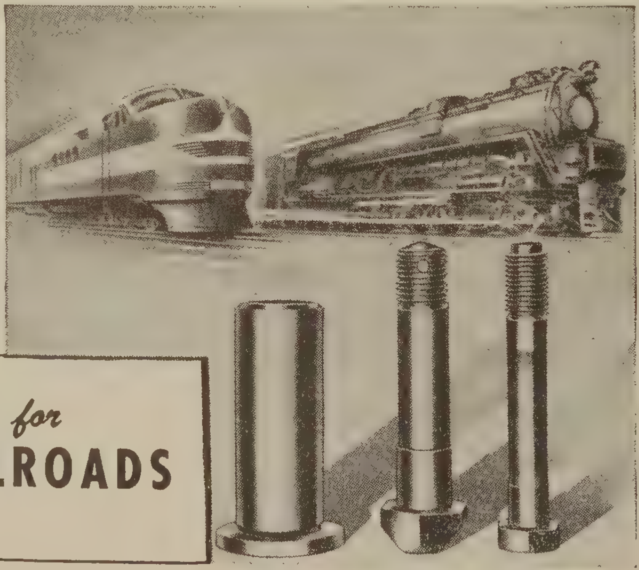
SEE OUR CATALOG IN SWEET'S

HENDRICK
Manufacturing Company
37 DUNDAFF STREET, CARBONDALE, PENNA.
Sales Offices In Principal Cities

Perforated Metals
Perforated Metal Screens
Architectural Grilles
Mitco Open Steel Flooring,
"Shur-Site" Treads and
Armorgrids

ERIE SPECIAL BOLTING
FOR HEAVY MACHINERY

FOR over 30 years ERIE has specialized in the manufacture of high quality bolting. We use the very latest equipment for heat treating, machining, grinding and threading. We are certain that we can produce better bolting at a saving to you because we are specialists — send us your bolting specification for our estimate.



for
RAILROADS

A DEPENDABLE SOURCE OF HIGH QUALITY BOLTING FOR RAILROADS, REFINERIES, DIESELS, FARM MACHINERY, EXCAVATING EQUIPMENT AND ALL TYPES OF HEAVY MACHINERY.

ERIE BOLT & NUT CO.
SUBSIDIARY OF BARIUM STEEL CORPORATION
ERIE, PA.
STUDS • BOLTS • NUTS ∼ ∼ ALLOYS • STAINLESS • CARBON • BRONZE

Tariff Act
1930; par. No. Description—Rate

or stays made of charcoal iron shall be subject to a less rate of duty than:
Old rate 1¼¢ lb; new rate ⅝¢ lb.

328 Flexible metal tubing or hose, whether covered with wire or other material, including any appliances or attachments affixed thereto, not specially provided for:
Old rate 30 pct ad valorem; new rate 20 pct ad valorem.

329 Chain and chains of all kinds, made of iron or steel:
Not less than ⅜ in. diam:
Old rate ⅞¢ or ¾¢ lb; new rate ½¢ lb.
Less than ⅜ and not less than 5/16 in. diam:
Old rate 1½¢ lb; new rate 1¢ lb.
Less than 5/16 in. diam.
Old rate 4¢ lb; new rate 2¢ lb.

329 Chains of iron or steel, used for the transmission of power, of not more than 2 in. pitch and containing more than 3 parts per pitch, and parts thereof, finished or unfinished:
Valued at less than 40¢ lb:
Old rate 40 pct ad valorem; new rate 30 pct ad valorem.
Valued at 40¢ lb or more:
Old rate 25 pct ad valorem; new rate 15 pct ad valorem.

329 All other chains used for the transmission of power, and parts thereof:
Old rate 25 pct ad valorem; new rate 15 pct ad valorem.

329 Anchor or stud link chain:
Two inches or more diam:
Old rate 1½¢ lb; new rate ¾¢ lb.
Less than 2 in. diam:
Old rate 2¢ lb; new rate 1¢ lb.

330 Nuts, nut blanks, and washers, of wrought iron or steel:
Old rate 0.6¢ lb; new rate 0.3¢ lb.

330 Bolts, with or without threads or nuts, and bolt blanks, of iron or steel:
Old rate 1¢ lb; new rate ½¢ lb.

330 Spiral nut locks, and lock washers, or iron or steel:
Old rate 35 pct ad valorem; new rate 20 pct ad valorem.

331 Cut nails and cut spikes, of iron or steel, exceeding 2 in. length:
Old rate 0.4¢ lb; new rate 0.3¢ lb.

331 Hobnails and cut nails, or iron or steel, not exceeding 2 in. length:
Old rate 15 pct ad valorem; new rate 10 pct ad valorem.

331 Nails, spikes, tacks, brads, and staples, made of iron or steel wire:
Not less than in. length or smaller than 0.065 in. diam:
Old rate 0.4¢ lb; new rate 0.2¢ lb.
Less than 1 in. length and smaller than 0.065 in. diam:
Old rate 0.75¢ lb; new rate 0.5¢ lb.

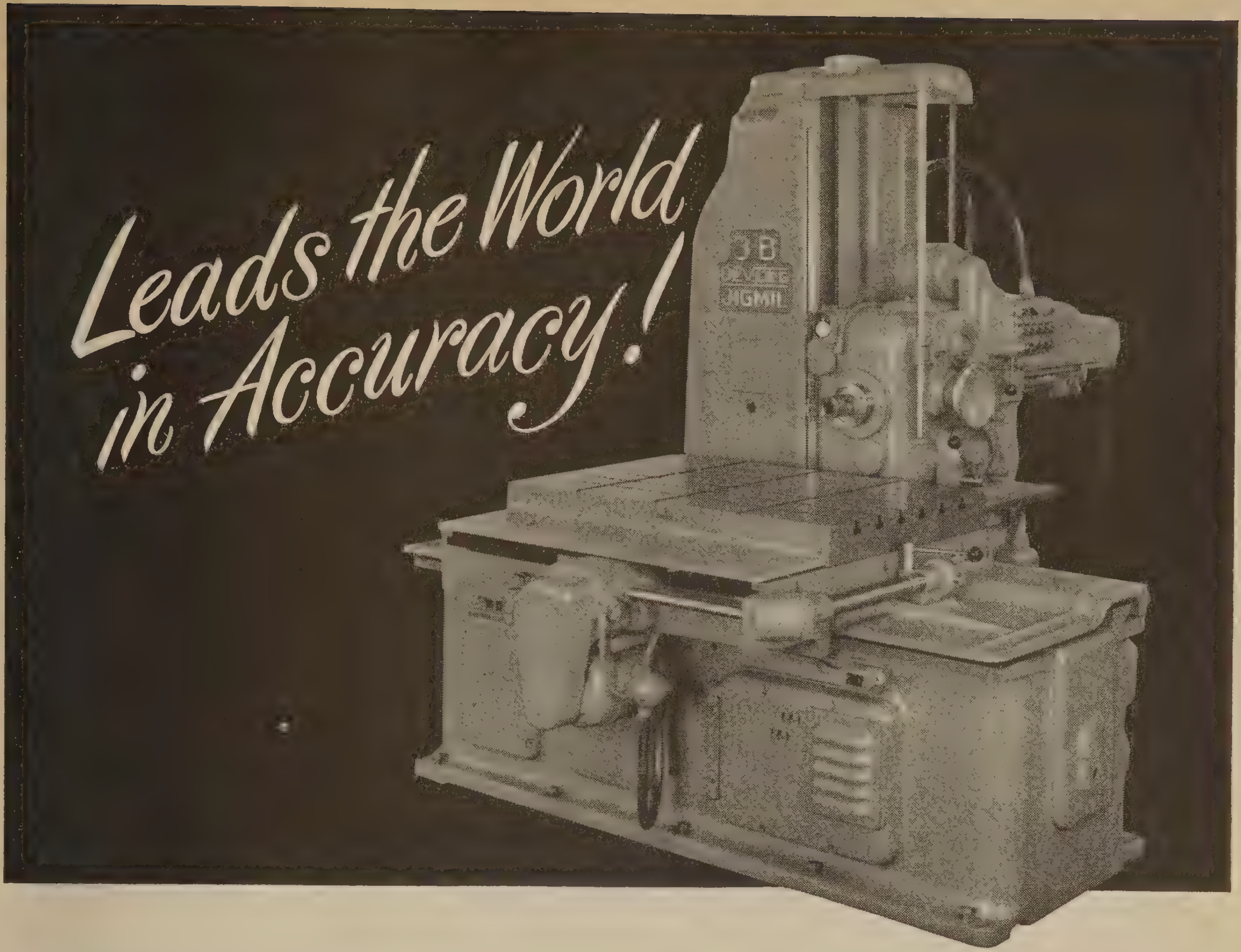
331 Staples, in strip form, for use in paper fasteners or stapling machines:
Old rate 2¢ lb; new rate 2¢ lb.

331 Spikes, tacks (not including thumb tacks,) brads, and staples, not specially provided for:
Old rate 0.6¢ lb; new rate 0.5¢ lb.

332 Rivets, studs, and steel points, lathed, machined, or brightened, and rivets or studs for nonskidding automobile tires:
Old rate 30 pct ad valorem; new rate 15 pct ad valorem.

332 Rivets of iron or steel, not specially provided for:
Old rate 1¢ lb; new rate ½¢ lb.

[TO BE CONTINUED]


Leads the World in Accuracy!
3B
DeVlieg
JIGMIL

The DeVlieg JIGMIL is now recognized as The World's Leader in the field of accurate boring, in addition to its unique capacity for high productivity on:

1. Single part precision boring.
2. Tool, jig and die work.
3. Repetitive production work without jigs.

Write today for new descriptive booklet.

DEVLIEG JIGMIL

DeVLIEG MACHINE COMPANY

450 FAIR AVE., FERNDALE 20, (DETROIT) MICH.

Retooling Programs Provide Source for General December Demand

• • • **Coming up** for the last round, December machine tool orders are landing in the same general, uneven spread that has been the pattern for 1947, a spotty year for builders and dealers alike.

According to reliable sources in the trade, demand is fairly general, and stems from retooling programs for the most part, which are the result of changes being made on the basis of economies. Inquiries are out in substantial numbers, and buyers are showing considerable interest in tool room equipment, including lathes and jig borers. Demand is pretty well centered on those machines not found on War Assets Administration's fixed price list, according to dealers and factory representatives.

Curiously enough, the machine tool industry is about the only industry not buying machine tools at the present time, which is probably due to the fact that the industry is pretty well tooled up for the going demand for some time to come.

Much of the business coming in at the present time has nothing to do with appropriations for 1947, but a lot of customers want equipment shipped at once so they can begin writing it off this year. December shipments will probably be up as a result.

In Detroit, a feeling of optimism prevails among machine tool builders and local representatives with suppliers of milling machines, portable tools and grinding machinery reporting a good volume of business and reassuring backlogs. Wtih few exceptions, producers of standard equipment have lost a lot of enthusiasm fighting government surplus and the present lack of interest of the motor car industry in variable purpose tools. On the other hand, on any special items, drills for example, that are used on transfer type machines, they report their present activity is at high level.

Demand is Centered Mostly On Tools Not on WAA's Fixed Price List

° ° °

Discussion of Russian orders is occupying a great deal of private conversation, with the sides being chosen for the most part on the basis of whether or not the plants would be busy enough without the Russian business. Whatever may be the actual situation at the moment, there can be little doubt that all firms in Detroit would prefer to be entirely free from transactions with Amtorg.

Evidence is increasing that intensive studies of their processing and engineering is going to result in the grouping of many kindred operations in automobile plants and requests for special equipment designed to perform all the operations required on such parts. Up to the present time, motor blocks, cylinder heads, and crankshafts have rceived most of the attention, but the fact that special equipment has been ordered for manifolds and rear axle housings gives a better indication of the potentialities of the new transfer-type machines.

In Chicago machinery dealers report December business has been very good and for the most part was equal to November, when business picked up after the show. Most observers indicate that the first half of 1948 looks very favorable and the general purpose machinery sales have picked up. They recall that the first half of 1947 most of the new business concerned special purpose machinery and generally the other tool items move very slowly. One reason cited by sales executives here for the recent upturn of general purpose machines is that the WAA is practically out of the picture.

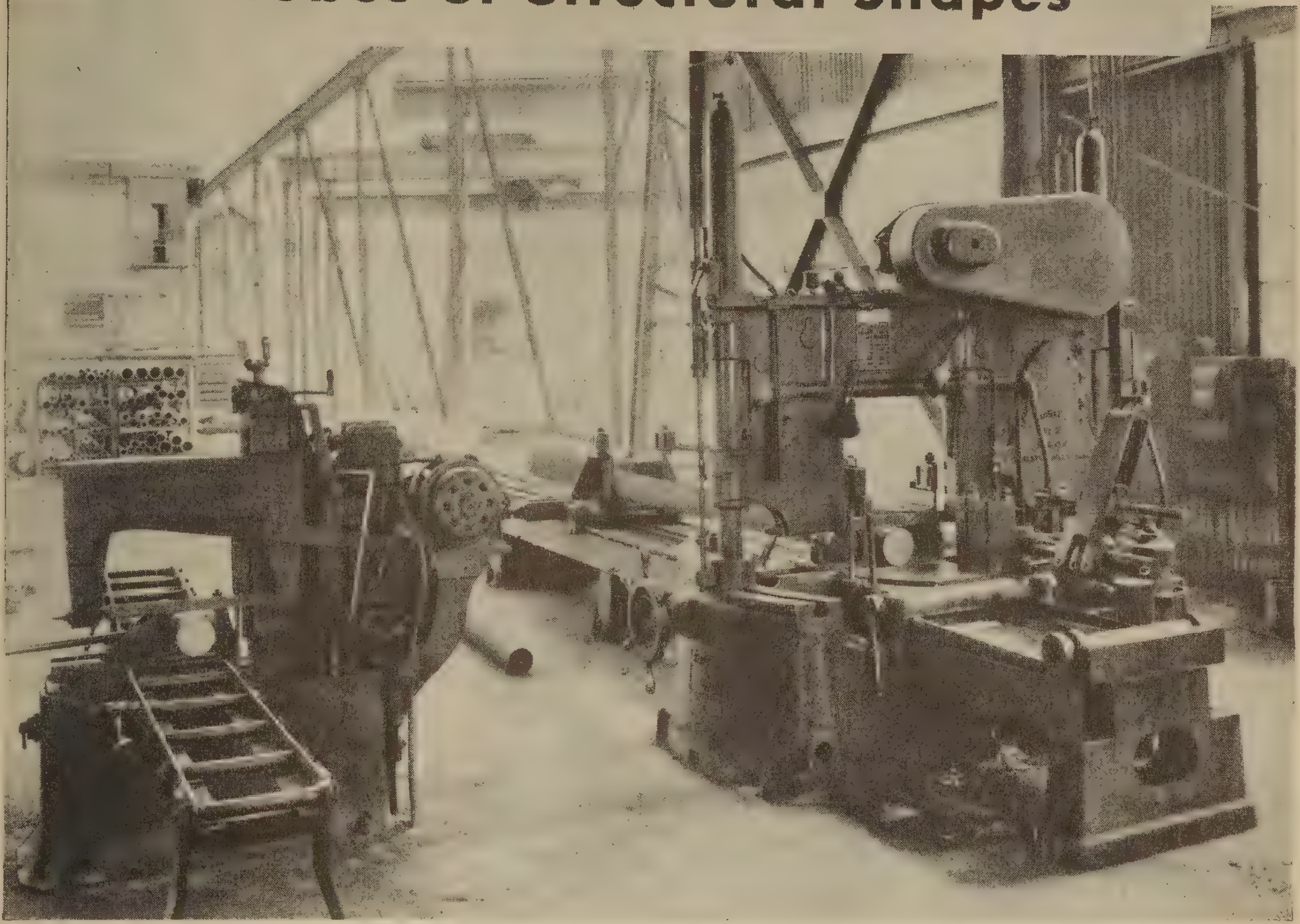
No one has any doubt that machinery prices will continue to go up. Dealers in Chicago recall they had increase in a major line prior to the show and that since the show two other lines have been increased. Cincinnati Milling Machine Co. last week reinstated the escalator clauses which they had previously struck out of their contracts about 6 months ago. Prior to this move on the part of Cincinnati Milling Machine, all items except electrical equipment were on a firm price basis. Machinery salesmen report there is already reluctance to buy at present prices and that it behooves the industry to hold the present price line, if at all possible.

In the next breath, these same men admit that they don't know how it can be done and they point out that a 10 pct increase in any tooling program represents a lot of money at the going cost level. When asked whether they thought a drop in prices would increase business, the general answer was "no." However, it is felt by sales executives in this area, that another general increase will hurt business.

Metal manufacturers in the Chicago area generally are going at a high clip and are committing themselves for as much new machinery and improvements as their budgets will possibly permit. The machinery salesmen report that their sales are well spread and are not concentrated in any particular field. The farm implement makers here in the midwest have been particularly heavy buyers.

An interesting sidelight is apparent here. There is nothing that the machine tool industry would like to see more than a going automobile concern in Chicago. So far the Tucker Corp., which many had hoped would bring this industry to Chicago, has not committed itself for production tooling. In fact, it is the opinion of the machine tool circles here that, although they hate to admit it, they are very pessimistic about Tucker's chances of actually getting into production while there is yet time.

Ideal for Oil Tools, Forging Bars, Tubes or Structural Shapes



The cutting-off department of Baash-Ross Company takes all sawing jobs as they come for they are equipped to quickly, easily and economically cut off steel of any size, type or shape. In the "oil tool" business you cut off about everything from drill rod to giant well drilling tools, from copper tubing to great 18 in. dia. heavy walled steel liner casings for wells. All can be quickly and accurately cut off with the saws illustrated—a No. 9A MARVEL High Speed Hack Saw (Capacity 10" x 10") and a No. 18 MARVEL Giant Hydraulic Hack Saw.

Ask to have the local MARVEL Sawing Engineer analyze your sawing problems, make recommendations and quote prices.

Write for Catalog

ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"

5700 Bloomingdale Avenue **Chicago 39, U. S. A.**

MARVEL *Metal Cutting* SAWS

Better Machines—Better Blades

NONFERROUS METALS

. . . News and Market Activities

RFC Raises Tin Price

New York

• • • **The price of** Grade A tin has been raised to 94.00¢ per lb, effective Dec. 19 by the Office of Metals Reserve, RFC. This price is an increase of 14.00¢ over the 80.00¢ price which became effective in April. The price announcement to its selling agency, Tin Sales Corp., included the phraseology "until further notice," which would indicate that a further incrase based on the current Bolivian negotiations must not be ruled out. The price of other grades of tin were established as follows: Grade B, 93.85¢; Grade C, 93.50¢; Grade 99.00 to 99.64 pct, 93.50¢; Grade 98.00 to 98.99 pct, 92.60¢. The prices of the last two grades are based on tin content.

RFC price action was based on the establishment on Thursday of higher British buying prices for Malayan tin and Nigerian concentrates. Malayan tin will be bought at £500 per long ton as compared with the previous price of £423, at the current exchange rate of $4.03, respectively 89.95¢ and 76.10¢ per lb. The sales price of Malayan tin to British consumers is made at £504, compared with £426 previously, in cents per pound equivalent at 90.67¢ and 76.64¢ respectively.

The negotiations with Bolivian producers are still involved with details on smelter impurity charges, freight differentials between Bolivian and Texas ports. By week-end there had been no serious discussion of concentrate price. There is some possibility that the U.K. Malayan price may govern the Bolivian price to the U. S. for concentrates, especially in view of the larger tonnages now coming from the Far East and an estimated 20,000 tons of pig tin in government stocks. All told, including permanent stockpile and concentrates, government tin is estimated at 50,000 tons.

It would be possible, however, for the RFC to pay Bolivian producers more under the law for the concentrates than the U.K. price basis and subsidize the Texas City smelter operation to some extent.

The British buying price for Nigerian concentrates was established at £477, as compared with the former price of £405 10s.

The RFC price has been based on the price of Malayan tin because of the larger tonnage which is now and in the future may be expected from that area. For that reason no price action was taken earlier when British prices were established for consumers of British Isles tin.

•

Reynolds Sees Price Rise

Louisville, Ky.

• • • **David P. Reynolds,** vice-president, Reynolds Metals Co., has estimated that the company's 1947 output of aluminum will be 400 million lb, 355 million lb primary and 45 million secondary, including 35 million lb from wrecked aircraft. This tonnage compares with Reynolds' production of 325 million lb in 1946. Total domestic production in 1939 was only 327 million lb.

Weighing prices against volume, Reynolds aluminum mill products show an average price reduction greater than 10 pct for 1947, according to Reynolds. He says that rapidly rising costs will soon be necessary in a number of products. Utility sheet, the largest volume item, was cut 15 pct and later raised 5 pct and, according to Reynolds, more than 75 pct of the year's business is said to have been done at the lower price. The chief item priced higher at year's end was sheet circles, up about 7½ pct.

Nonferrous Metals Prices

Cents per pound

	Dec. 17	Dec. 18	Dec. 19	Dec. 20	Dec. 22	Dec. 23
Copper, electro, Conn.	21.50	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn.	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Grade A, New York	80.00	80.00	94.00	94.00	94.00	94.00
Zinc, East St. Louis	10.50	10.50	10.50	10.50	10.50	10.50
Lead, St. Louis	14.80	14.80	14.80	14.80	14.80	14.80

•

Eckert to Head Bureau

New York

• • • **Dr. Walter Ingalls** has announced his retirement as director of the American Bureau of Metal Statistics. He will be succeeded, effective Jan. 1, by Mr. R. R. Eckert, who is now and will continue as secretary-treasurer of the Copper Institute and the United States Copper Assn. Temporarily the two offices will continue at their present locations and Mr. Eckert expects to spend half the day at each office. When office space becomes available, the two offices will probably be consolidated.

•

Raise Ingot Prices

New York

• • • **The price increase** on tin has prompted ingot producers to raise their prices on bronze ingots containing tin by ½¢ to 1½¢ per lb depending on the tin content. Manganese bronze grades 423 and 424 are now sold by some producers at 22.00¢ and 23.00¢ respectively. Other grades have not been changed. Continued shortages of copper and brass scrap confront ingot producers and, in view of higher scrap prices, some readjustments of non-tin-containing grades have been made to bring about a more appropriate price relationship. Along these lines, grades 131 and 132 have been raised to 19.25¢ and 19.00 respectively.

Big Dredge for Engineers

Pittsburgh

• • • **A seagoing dredge** that can strip 12,000 tons of dirt and muck from navigable channels in two hours will soon take up its duties for the U. S. Corps of Engineers, it has been disclosed by engineers of the Westinghouse Electric Corp., Pittsburgh.

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point, freight allowed	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American Laredo Tex.	33.00
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be	$20.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$40.00
Cadmium, del'd	$1.75
Cobalt, 97-99% (per lb)	$1.65 to $1.72
Copper electro, Conn. Valley	21.50
Copper, lake, Conn. Valley	21.625
Gold, U. S. Treas., dollars per oz	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$80 to $90
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask, f.o.b. New York	$80 to $82
Nickel, electro, f.o.b. New York	37.67
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$66 to $69
Silver, New York, cents per oz.	74.625
Tin, Grade A, New York	94.00
Zinc, East St. Louis	10.50
Zinc, New York	11.06
Zirconium copper, 6 pct Zr. per lb contained Zr.	$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No. 115	18.50-19.00
No. 120	18.00-18.50
No. 123	17.50-18.00
80-10-10 ingot	
No. 305	23.50-24.00
No. 315	21.00-21.50
88-10-2 ingot	
No. 210	30.00-30.50
No. 215	28.00-28.50
No. 245	22.75-23.25
Yellow ingot	
No. 405	14.50-15.50
Maganese Bronze	
No. 421	18.00-18.50

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys:	
0.30 capper, max.	16.00-16.75
0.60 copper, max.	15.50-16.25
Piston alloys (No. 122 type)	15.50-16.00
No. 12 alum. (No. 2 grade)	15.25-15.75
108 alloy	15.50-16.00
195 alloy	15.50-16.50
AXS-679	15.75-16.25

Steel deoxidizing aluminum, notch-bar, granulated or shot

Grade 1—95 pct-95½ pct	15.25-16.00
Grade 2—92 pct-95 pct	14.00-15.00
Grade 3—90 pct-92 pct	13.50-14.50
Grade 4—85 pct-90 pct	13.25-14.00

Electroplating Supplies

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	37⅝
Electrodeposited	32.34
Rolled, oval, straight, delivered	32.59
Brass, 80-20, frt allowed	
Cast, oval, 15 in. or longer	33⅝
Zinc, cast, 99.99	18¾
Nickel, 99 pct plus, frt allowed	
Cast	51
Rolled, depolarized	52
Silver 999 fine	
Rolled, 1000 oz. lots, per troy oz.	67¼

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	44.50
Copper sulfate, 99.5, crystals, bbls	11.50
Nickel salts, single, 425 lb bbls, frt allowed	14.50
Silver cyanide, 100 oz. lots, per oz.	54.00
Sodium cyanide, 96 pct, domestic, 200 lb drums	16.00
Zinc cyanide, 100 lb drums	35.50
Zinc sulfate, 89 pct, granules, bbls, frt allowed	7.75

Mill Products

Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall; 3S, 43.5¢; 52S-O, 67¢; 24S-T, 71¢; base, 30,000 lb.

Plate: ¼ in. and heavier; 2S, 3S, 21.2¢; 52S, 24.2¢ 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S, 75-S-AL, 30.5¢; base, 30,000 lb.

Flat Sheet: 0.136-in. thickness; 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb.

Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S 45.5¢; base, 30,000 lb.

Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 37.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢; 1 in., 2 in., 27¢; base, 5000 lb. *Rod:* 2S, 3S, 1¼ to 2½ in. diam. rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. *Round Wire:* drawn, coiled, B & S gage 17-18; 2S, 3S, 33.5¢; 56S, 39.5¢ 10,000 lb base. B & S gage 00-1; 2S, 3S, 21¢; 56S, 30.5¢. B & S 15-16; 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.

Magnesium

(Cents per lb f.o.b. mill. Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSa. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 14, 69¢-74¢; 16, 79¢-81¢; 18, 87¢-89¢; 22, $1.25-$1.31; 24, $1.71-$1.75.

Round Rod: M, diam, in., ¼ to ⅜, 47¢; ½ to ¾, 45¢ 1¼ to 2½, 43.5¢; 3½ to 5, 42.5¢. Other alloys higher.

Square, Hexagonal Bar: M, size across flats, in., ¼ to ⅜, 52.5¢; ½ to ¾, 47.5¢; 1¼ to 2½, 45¢; 3½ to 5, 44¢. Other alloys higher.

Solid Shapes, Rectangles: M, form factors, 1 to 4, 46¢; 11 to 13, 49¢; 20 to 22, 51.5¢; 29 to 31, 59.5¢; 38 to 40, 75.5¢; 47 to 49, 98¢. Other alloys higher.

Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16, $1.21; 5/16 to ⅜, $1.12; ⅜ to 7/16, 97¢; 0.058 to 0.064, 7/16 to ½, 89¢; ½ to ⅝, 81¢; 0.065 to 0.082, ⅝ to ¾, 76¢; ¾ to 1, 72¢; 0.083 to 0.108, 1 to 2, 68¢; 0.165 to 0.219, 2 to 3, 59¢; 3 to 4, 57¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets	..	41
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks	..	31

Zinc

(Cents per lb, f.o.b. mill)

Sheet, l.c.l.	15.50
Ribbon, ton lots	14.50
Plates	
Small	13.50
Large, over 12 in.	14.50

Copper, Brass, Bronze

Cents per pound, freight prepaid on 200 lb.

	Extruded Shapes	Rods	Sheets
Copper	33.53	....	33.68
Copper, hot-rolled	....	30.03	....
Copper, drawn	....	31.03	...
Low brass	34.04*	31.07	31.38
Yellow brass	32.39*	29.32	29.63
Red brass	34.65*	31.68	31.99
Naval brass	29.56	28.31	34.25
Leaded brass	27.98	24.39	30.13
Commercial bronze	35.52*	32.80	33.11
Manganese bronze	33.14	31.64	37.75
Phosphor bronze, 5 pct.	53.25*	52.25	52.00
Muntz metal	29.17	27.92	32.36
Everdur, Herculoy, Olympic, etc.	37.07	35.57	38.44
Nickel silver, 5 pct.	41.20	40.28	38.67
Architectural bronze	27.94	....	....

*Seamless tubing.

Scrap Metals

Brass Mill Scrap

(Lots of less than 15,000 lb.)

Cartridge brass turnings	14⅛
Loose yellow brass trimmings	15⅛

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Copper and Brass

No. 1 heavy copper and wire	16½—17
No. 2 heavy copper and wire	15½—16
Light copper	14 —14½
Auto radiators (unsweated)	9¼— 9¾
No. 1 composition	12 —12½
No. 1 composition turnings	11½—12
Clean red car boxes	10 —10½
Cocks and faucets	9¾—10¼
Mixed heavy yellow brass	7½— 8
Old rolled brass	8 — 8½
Brass pipe	8¾— 9¼
New soft brass clippings	11½—12
Brass rod ends	9 — 9⅛
No. 1 brass rod turnings	9 — 9½

Aluminum

Alum. pistons with struts	4½— 5
Aluminum crankcases	6 — 6⅛
2S aluminum clippings	9 — 9⅛
Old sheet & Utensils	6 — 6⅛
Mixed borings and turnings	— 2
Misc. cast aluminum	5½— 6
Dural clips (24S)	5 — 5⅛

Zinc

New zinc clippings	6 — 6½
Old zinc	4½— 5
Zinc routings	2⅛— 3
Old die cast scrap	2⅛— 3

Nickel and Monel

Pure nickel clippings	15⅛—17⅛
Clean nickel turnings	14 —15
Nickel anodes	16 —17
Nickel rod ends	16 —17
New Monel clippings	12 —13
Clean Monel turnings	7 — 8
Old sheet Monel	10 —10⅛
Old Monel castings	7⅛— 8
Inconel clippings	8 — 8⅛
Nickel silver clippings, mixed	7⅛— 8
Nickel silver turnings, mixed	5⅛— 6

Lead

Soft scrap lead	11¼—11¾
Battery plates (dry)	6½— 7

Magnesium Alloys

Segregated solids	6⅛— 7
Castings	4⅛— 5⅛

Miscellaneous

Block tin	73 —75
No. 1 pewter	53 —55
No. 1 auto babbitt	43 —45
Mixed common babbitt	11½—12
Solder joints	16½—17
Siphon tops	43 —45
Small foundry type	13 —13⅛
Monotype	12 —12⅛
Lino and stereotype	11½—12
Electrotype	10 —10½
New type shell cuttings	11 —11⅛
Clean hand picked type shells	4½— 5
Lino and stereo dross	5 — 5⅛
Electro dross	3¼— 3½

Lead Products

(Cents per lb)

F.o.b. shipping point freight collect Freight equalized with nearest free delivery point.

Full lead sheets	18.25
Cut lead sheets	18.75
Lead pipe, manufacturing point	17.50
Lead traps and bends ....List	+42%
Combination lead and iron bends and ferrules, also combination lead and iron ferrules ....List	+42%
Lead wool	19.50

UNITED STATES STEEL SUPPLY COMPANY
USS
STEELS
SERVICE
UNITED STATES STEEL

1948

A year of promise

WITH the arrival of another Holiday Season, we find ourselves looking forward to 1948 as—A Year of Promise. This good feeling comes from the knowledge that the steel industry is already engaged in the greatest expansion program in its history.

The benefits of increased supply from added producing facilities will naturally be gradual, but we go into 1948 fully expecting to do a better job of taking care of your steel requirements.

We have already improved our facilities for service by erecting new modern warehouses in Cleveland and St. Louis. We have also opened a new warehouse in Los Angeles which will go a long way toward supplying the needs of steel users on the West Coast. And we expect to make other improvements and additions to our service facilities during 1948, so that our name will continue to be a "Symbol of Service" to steel users.

Meanwhile, we extend to you our cordial best wishes for a happy Holiday Season and a successful, prosperous New Year.

UNITED STATES STEEL SUPPLY COMPANY

BALTIMORE · BOSTON · CHICAGO · CLEVELAND
LOS ANGELES · MILWAUKEE · NEWARK
PITTSBURGH · ST. LOUIS · TWIN CITY (St. Paul)

Heavy Consumer Purchases Expected Soon

New York

• • • **Steel mills remained** out of the market in the main this week, although there were some reports of a resumed buying in southern and eastern markets. Many brokers were expecting a resumption of heavy mill buying before the end of next week, and at least one large consumer is expected to come into the market before the end of the year.

While price levels remained stable in the principal consuming markets, there was little activity represented by those quotations. Meanwhile, those brokers in Boston and New York who had been restricting their offers to the maximum allowed by the formula price system saw transactions occurring at a level between the high October levels and the much reduced offers which have prevailed since that time.

There are indications that some mills have been fostering a two price system. While paying lip service to substantially reduced price levels, they have been arranging purchases at a definitely higher figure.

The price testing period will become acute during the first of the year. Mills have stopped the acute rise of October by curtailing purchases. Inventories have suffered as a result. The new purchases expected in January will afford the real testing that has been long awaited.

Cast scrap and specialty grades have continued their steady increase. The reluctance to buy heavy melting steel grades is undoubtedly having its effect on this situation. Many mills have bought unusually large amounts of railroad grades when No. 1 steelmaking scrap has been unobtainable at present prices.

•

PITTSBURGH — The usual year-end lethargy settled over the market this week. Cast continued active however and prices were up $1. As expected, steel foundries trying to get lower prices for railroad specialties got no allocations at those prices. Reports of high priced purchases of openhearth steel scrap in the South continued but brokers here are generally running low on orders. Many foundries are closing down for 4 days or more over the holidays; this reduces pressure for these grades but no price changes have occurred. This weeks' sharp cut in ingot operations also eases demand for openhearth grades so that a real test of the $40 price may be deferred until next year.

•

CHICAGO — Except for earmarked tonnages coming in from the mills' customers, the only openhearth scrap that is moving is spot cars on track. Tonnages which will be shipped from now to the first of the year are expected to be very light. The mills are reaching out and bidding up out of district scrap prices some of which is coming in at around $44 delivered. Foundries continue to pay fantastic prices as they are convinced the pig iron supply is destined to shrink still further. All eyes are on the mills, which on Jan. 1 will have to decide about formula prices. Some observers declare that at least one mill in this area may be forced to buy before F-day, as the inventories are alarmingly low.

•

PHILADELPHIA—The market is showing technical weakness in openhearth grades combined with considerable strength in other grades as the result of the diversion of some heavy melting requirements to other grades not controlled by formula. Sales of heavy melting have been made at $41 to consumers during the week but the volume placed is light because of the shortage of scrap. Turnings are reported to be strong but prices are unchanged. Cast prices are higher. Machinery cast is quoted at $55 to $56, mixed yard cast at $50 to $54, heavy breakable at $50 to $52, auto cast unchanged. Heavy axle forge turnings is in demand for electric furnaces and is being bought in small lots at higher prices than the $42.50 to $43.50 quoted.

•

CLEVELAND — Big test of scrap market prices will come after the first of the year, according to major consumers here and in the Valley. In the meantime, rumors of higher prices paid for tonnages of out of district material are the only disquieting factor in the holiday lull. Out of district material is once more beginning to include all material not in the switching district. Shipments are down, and some buyers are about ready to consider the less desirable grades and probably higher prices. Indications are that some of the smaller mills are putting out feelers or actual orders to bring in some tonnage before the big blow. According to reports, some major consumers have again extended the effective dates on their high priced orders.

•

DETROIT—While the price formula for steel scrap is holding at Detroit there are strong indications that the underlying pressures are building up: Dealers reportedly refusing to take orders, loss of plant scrap because of December inventory taking, etc. There are also unconfirmed reports of overgrading and extension of high priced orders. In the meantime, the upward spiral in cast iron grades shows no signs of abating. offers as high as $70 per ton in cases of extreme hardship have been reported. With pig iron even scarcer than gray iron scrap, the $40 increase in foundry scrap in Detroit since OPA is causing genuine concern in many circles.

•

NEW YORK—The big tonnage market for major steelmaking scrap grades continued to be quiet, as it has been for several weeks. At the same time, the market for scrap for the smaller steel mills in the east continues to be active. From the two price condition which has prevailed since the inception of the formula pricing plan some weeks ago, the local broker's quotations narrowed this week to a range of $35 to $36 for No. 1 heavy melting steel. Strength in cast grades remained firm.

•

ST. LOUIS — Foundry grades were from $1 to $4 higher in the St. Louis market. Their upward flight to new highs was continued as a result of the shortage of these items and pig iron and the heavy demand. Shipments of all grades have been light, especially melting steel price being a factor there. The usual holiday letdown is here.

•

BUFFALO — Cast scrap continued to feature the market in the absence of new business in openhearth steel. Strictly No. 1 cupola sold at $58 to $60 a ton, an advance of about $5, and mixed yard cast was quoted a couple dollars higher at $53 to $55. Demand was very strong as foundries tried to make up for reduced pig iron supplies with scrap. The major consumers of steelmaking scrap held to their price formula of $20 over the old OPA ceiling, or $39.25 for heavy melting and bundles, but dealers refused to do business.

•

BOSTON—Brokers no longer talk $31 for heavy steel; instead $31.40, and still fail to dislodge scrap. Yards, operating on reduced scales, are not interested and continue to accumulate stocks which, however, are not large. It is a stalemate situation. On the other hand demand for cast is active, and supply is uncertain. Cast prices are fully maintained at the 1947 high level.

•

BIRMINGHAM — The scrap market in this district is in the usual Christmas holiday lull. Little activity until after the first of the year is indicated. Mills and dealers still are deadlocked over the $37 price offered by the former for openhearth grades. Foundries are being affected in varying degrees by the continuing scarcity and only fair quality of cast grades.

•

TORONTO—Business is virtually at a standstill in the Canadian scrap iron and steel markets. Local dealers state that receipts have practically ceased and for the past week scrap deliveries to consuming plants have been at the lowest level for the year.

IRON AND STEEL SCRAP PRICES

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	.... $40.00
RR. hvy. melting	$40.50 to 41.00
No. 2 hvy. melting	.... 40.00
RR. scrap rails	49.00 to 50.00
Rails 2 ft. and under	54.00 to 55.00
No. 1 comp'd bundles	.... 40.00
Hand bdld. new shts.	.... 40.00
Hvy. axle turn.	41.50 to 42.00
Hvy. steel forge turn.	41.50 to 42.00
Mach. shop turn.	35.00 to 35.50
Shoveling turn.	36.50 to 37.00
Mixed bor. and turn.	35.00 to 35.50
Cast iron borings	35.50 to 36.00
No. 1 cupola cast.	54.00 to 55.00
Hvy. breakable cast.	41.50 to 42.50
Malleable	60.00 to 61.00
RR. knuck, and coup.	52.50 to 53.50
RR. coil springs	52.50 to 53.50
RR. leaf springs	52.50 to 53.50
Rolled steel wheels	52.50 to 53.50
Low phos.	47.00 to 48.00

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$38.50 to $39.00
No. 2 hvy. melting	38.50 to 39.00
No. 1 bundles	38.50 to 39.00
No. 2 dealers' bundles	38.50 to 39.00
Bundled mach. shop turn.	38.50 to 39.00
Galv. bundles	36.50 to 37.00
Mach. shop turn.	33.50 to 34.00
Short shov. turn.	36.00 to 37.00
Cast iron borings	34.50 to 35.00
Mix. borings & turn.	33.50 to 34.00
Low phos, hvy. forge	47.00 to 48.00
Low phos, plates	44.00 to 45.00
No. 1 R.R. hvy. melt.	46.00 to 47.00
Rerolling rails	60.00 to 61.00
Miscellaneous rails	54.00 to 55.00
Angles & splice bars	55.00 to 56.00
Locomotive tires, cut	55.00 to 56.00
Cut bolster & side frames	54.00 to 54.50
Standard stl. car axles	60.00 to 61.00
No. 3 steel wheels	51.50 to 52.00
Couplers & Knuckles	52.00 to 52.50
Rails 2 ft. and under	60.00 to 62.00
Malleable	71.00 to 73.00
No. 1 mach. cast.	62.00 to 65.00
No. 1 agricul. cast.	60.00 to 61.00
Hvy. breakable cast.	45.00 to 48.00
RR. grate bars	52.00 to 53.00
Cast iron brake shoes	52.00 to 53.00
Cast iron carwheels	49.00 to 50.00

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	$38.00 to $40.00
No. 2 hvy. melting	38.00 to 40.00
No. 1 bundles	38.00 to 40.00
No. 2 bundles	38.00 to 40.00
Mach. shop turn.	33.00 to 34.00
Shoveling turn.	33.00 to 34.00
Cast iron borings	30.00 to 31.00
Mixed bor. & turn.	30.00 to 31.00
Low phos. plate	49.00 to 50.00
No. 1 cupola cast.	53.00 to 55.00
Hvy. breakable cast.	42.00 to 43.00
Scrap rails	49.00 to 50.00

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars:

No. 1 hvy. melting	$33.00 to $33.50
No. 2 hvy. melting	33.00 to 33.50
Nos. 1 and 2 bundles	33.00 to 33.50
Busheling	33.00 to 33.50
Shoveling turn.	30.00 to 30.50
Machine shop turn.	28.00 to 28.50
Mixed bor. & turn.	28.00 to 28.50
Cl'n cast. chem. bor.	33.00 to 34.00
No. 1 machinery cast.	44.00 to 45.00
No. 2 machinery cast.	44.00 to 45.00
Heavy breakable cast.	40.00 to 41.00
Stove plate	39.00 to 40.00

DETROIT

Per gross ton, brokers' buying prices, f.o.b. cars:

No. 1 hvy. melting	$34.75 to $35.25
No. 2 hvy. melting	34.75 to 35.25
No. 1 bundles	34.75 to 35.25
New busheling	34.75 to 35.25
Flashings	34.75 to 35.25
Mach. shop turn.	28.50 to 29.00
Shoveling turn.	29.50 to 30.00
Cast iron borings	29.50 to 30.00
Mixed bor. & turn.	29.50 to 30.00
Low phos. plate	39.75 to 40.25
No. 1 cupola cast.	55.00 to 60.00
Heavy breakable cast.	45.00 to 48.00
Stove plate	45.00 to 48.00
Automotive cast.	55.00 to 60.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00 to $41.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	40.00 to 41.00
Mach. shop turn.	33.50 to 34.50
Shoveling turn.	35.00 to 36.00
Mixed bor. & turn.	33.50 to 34.50
Clean cast chemical bor.	39.00 to 41.00
No. 1 machinery cast.	55.00 to 56.00
No. 1 mixed yard cast.	50.00 to 54.00
Hvy. breakable cast.	50.00 to 52.00
Clean auto cast.	55.00 to 56.00
Hvy. axle forge turn.	42.50 to 43.50
Low phos. plate	46.50 to 47.50
Low phos. punchings	46.50 to 47.50
Low phos. bundles	45.50 to 46.50
RR. steel wheels	50.00 to 51.00
RR. coil springs	50.00 to 51.00
RR. malleable	65.00 to 70.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.50 to $41.00
No. 2 hvy. melting	38.00 to 39.00
Bundled sheets	38.00 to 39.00
Mach. shop turn.	32.00 to 33.00
Locomotive tires, uncut	46.00 to 47.00
Mis. std. sec. rails	52.00 to 53.00
Rerolling rails	57.00 to 58.00
Steel angle bars	53.00 to 54.00
Rails 3 ft. and under	56.00 to 58.00
RR. steel Springs	49.00 to 50.00
Steel car axles	51.00 to 52.00
Grate bars	50.00 to 51.00
Brake shoes	52.00 to 53.00
Malleable	66.00 to 68.00
Cast iron car wheels	51.00 to 52.00
No. 1 machinery cast.	56.00 to 57.00
Hvy. breakable cast.	48.00 to 49.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	37.00 to 38.00
No. 2 bundles	37.00 to 38.00
No. 1 busheling	37.00 to 38.00
Long turnings	23.00 to 24.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	24.00 to 25.00
Bar crops and plate	38.00 to 38.50
Structural and plate	38.00 to 38.50
No. 1 cupola cast.	55.00 to 57.50
Stove plate	48.00 to 50.00
No. 1 RR. hvy. melt.	36.00 to 37.00
Steel axles	38.00 to 39.00
Scrap rails	37.50 to 38.00
Rerolling rails	52.00 to 54.00
Angles & splice bars	40.00 to 41.00
Rails 3 ft. & under	40.00 to 41.00
Cast iron carwheels	47.00 to 48.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.50 to $40.00
No. 2 hvy. melting	39.50 to 40.00
Mach. shop turn.	34.50 to 35.00
Short shov. turn.	36.50 to 37.00
Cast iron borings	35.50 to 36.00
Low phos	47.00 to 47.50

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	35.00 to 36.00
No. 2 bundles	35.00 to 36.00
Comp. galv. bundles	32.00 to 33.00
Mach. shop turn.	30.00 to 31.00
Mixed bor. & turn.	30.00 to 31.00
Shoveling turn.	30.00 to 31.00
No. 1 cupola cast.	46.00 to 47.00
Hvy. breakable cast.	46.00 to 47.00
Charging box cast.	46.00 to 47.00
Stove plate	46.00 to 47.00
Clean auto cast.	46.00 to 47.00
Unstrip. motor blks.	43.50 to 44.00
Cl'n chem. cast bor.	33.50 to 34.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	39.00 to 40.00
No. 2 bundles	39.00 to 40.00
No. 1 busheling	39.00 to 40.00
Mach. shop turn.	32.50 to 33.50
Shoveling turn.	34.50 to 35.50
Cast iron borings	31.50 to 32.50
Mixed bor. & turn.	31.50 to 32.50
Mixed cupola cast.	53.00 to 55.00
Charging box cast.	48.00 to 50.00
Stove plate	52.00 to 54.00
Clean auto cast.	58.00 to 60.00
RR. Malleable	70.00 to 72.00
Small indl. malleable	47.00 to 49.00
Low phos. plate	46.00 to 49.00
Scrap rails	49.00 to 50.00
Rails 3 ft. & under	52.00 to 54.00
RR. steel wheels	48.00 to 50.00
Cast iron carwheels	48.00 to 50.00
RR. coil & leaf spgs.	48.00 to 50.00
RR. knuckles & coup.	48.00 to 50.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.00 to $39.50
No. 2 hvy. melting	39.00 to 39.50
No. 1 bundles	39.00 to 39.50
No. 1 busheling	39.00 to 39.50
Drop forge flashings	39.00 to 39.50
Mach. shop turn.	34.00 to 34.50
Shoveling turn.	36.00 to 36.50
Steel axle turn.	39.00 to 39.50
Cast iron borings	35.00 to 35.50
Mixed bor. & turn.	34.00 to 34.50
Low phos.	44.00 to 44.50
No. 1 machinery cast.	56.00 to 60.00
Malleable	68.00 to 70.00
RR. cast.	58.00 to 60.00
Railroad grate bars	50.00 to 52.00
Stove plate	52.00 to 54.00
RR. hvy. melting	40.00 to 40.50
Rails 3 ft. & under	58.00 to 60.00
Rails 18 in. & under	59.00 to 61.00

SAN FRANCISCO

Per gross ton f.o.b. shipping point:

No. 1 hvy. melting	.... $25.00
No. 2 hvy. melting	.... 25.00
No. 2 bales	.... 25.00

Per gross ton delivered to consumer:

No. 3 bales	.... $19.50
Mach. shop turn.	.... 16.00
Elec. furn. 1 ft. und	$32.00 to 34.00
No. 1 cupola cast.	32.00 to 33.00
RR. hvy. melting	.... 26.00

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	.... $25.50
No. 2 hvy. melting	.... 25.50
No. 1 bales	.... 25.50
No. 2 bales	.... 25.50
No. 3 bales	.... 19.50
Mach. shop turn.	.... 17.50
No. 1 cupola cast.	$36.00 to 40.00
RR. hvy. melting	.... 26.50

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	$24.00 to $26.50
Elec. furn. 1 ft. and und.	27.50 to 30.00
No. 1 cupola cast.	.... 27.50
RR. hvy. melting	25.00 to 26.00

HAMILTON, ONT.

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point

Heavy melting	$22.00*
No. 1 bundles	22.00*
No. 2 bundles	21.50*
Mechanical bundles	20.00*
Mixed steel scrap	19.00*
Mixed borings and turnings	17.00*
Rails, remelting	23.00*
Rails, rerolling	26.00*
Bushelings	17.00*
Bushelings, new fact., prep'd	21.00*
Bushelings, new fact., unprep'd	16.00*
Short steel turnings	17.00*
No. 1 cast.	36.00 to 40.00

*Ceiling Price.

Comparison of Prices . .

Advances over past week in Heavy Type, declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-rolled Steel: (cents per pound)	Dec. 23, 1947	Dec. 16, 1947	Nov. 25, 1947	Dec. 24, 1946
Hot-rolled sheets	2.80	2.80	2.80	2.50
Cold-rolled sheets	3.55	3.55	3.55	3.20
Galvanized sheets (10 ga.)	3.95	3.95	3.95	3.55
Hot-rolled strip	2.80	2.80	2.80	2.50
Cold-rolled strip	3.55	3.55	3.55	3.20
Plates	2.95	2.95	2.95	2.50
Plates wrought iron	6.85	6.85	6.85	4.112
Stain's c-r strip (No. 302)	30.50	30.50	30.50	30.30
*24 gage				
Tin and Terneplate: (dollars per base box)				
Tinplate, standard cokes	$5.75	$5.75	$5.75	$5.00
Tinplate, electro (0.50 lb)	5.05	5.05	5.05	4.50
Special coated mfg. ternes	4.90	4.90	4.90	4.30
Bars and Shapes: (cents per pound)				
Merchant bars	2.90	2.90	2.90	2.60
Cold-finished bars	3.55	3.55	3.55	3.10
Alloy bars	3.30	3.30	3.30	3.05
Structural shapes	2.80	2.80	2.80	2.35
Stainless bars (No. 302)	26.00	26.00	26.00	25.97
Wrought iron bars	7.15	7.15	7.15	4.76
Wire and Wire Products: (cents per pound)				
Bright wire	3.55	3.55	3.55	3.05
Wire nails	4.25	4.25	4.25	3.75
Rails: (dollars per 100 lb)				
Heavy rails	$2.75	$2.75	$2.75	$2.50
Light rails	3.10	3.10	3.10	2.85
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$45.00	$45.00	$45.00	$39.00
Sheet bars	66.00	66.00	66.00	38.00
Slabs, rerolling	45.00	45.00	45.00	39.00
Forging Billets	55.00	55.00	55.00	47.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	61.00
Wire Rods and Skelp: (cents per pound)				
Wire rods	2.80	2.80	2.80	2.55
Skelp	2.60	2.60	2.60	2.05

Pig Iron: (per gross ton)	Dec. 23, 1947	Dec. 16, 1947	Nov. 25, 1947	Dec. 24, 1946
No. 2, foundry, Phila.	$40.97	$40.97	$40.97	$32.43
No. 2, Valley furnace	36.50	36.50	36.50	30.50
No. 2, Southern Cin'ti	40.24	40.24	40.24	29.80
No. 2, Birmingham	34.88	34.88	34.88	26.88
No. 2, foundry, Chicago†	36.00	36.00	36.00	30.50
Basic del'd Philadelphia	40.47	40.47	40.47	31.93
Basic, Valley furnace	36.00	36.00	36.00	30.00
Malleable, Chicago†	36.50	36.50	36.50	30.50
Malleable, Valley	36.50	36.50	36.50	30.50
Charcoal, Chicago	56.04	56.04	56.04	42.99
Ferromanganese‡	145.00	145.00	145.00	135.00

---

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.

‡ For carlots at seaboard.

Scrap: (per gross ton)	Dec. 23, 1947	Dec. 16, 1947	Nov. 25, 1947	Dec. 24, 1946
Heavy melt'g steel, P'gh.	$40.00	$40.00	$40.00	$32.25
Heavy melt'g steel, Phila.	40.50	40.50	43.00	31.00
Heavy melt'g steel, Ch'go	38.75	38.75	38.75	30.25
No. 1, hy. comp. sheet, Det.	34.75	34.75	34.75	28.50
Low phos. Young'n	47.25	47.25	47.25	34.25
No. 1, cast, Pittsburgh	54.50	53.50	52.00	37.50
No. 1, cast, Philadelphia	55.50	53.50	53.00	41.50
No. 1, cast, Chicago	63.50	63.50	52.50	44.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$12.50	$12.50	$12.50	$8.75
Foundry coke, prompt	14.00	14.00	14.00	8.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro., Conn.	21.50	21.50	21.50	19.50
Copper, Lake, Conn.	21.625	21.625	21.625	19.625
Tin, Grade A, New York	94.00	80.00	80.00	70.00
Zinc, East St. Louis	10.50	10.50	10.50	10.50
Lead, St. Louis	14.80	14.80	14.80	12.35
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	37.67	37.67	37.67	37.67
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	33.00	33.00	33.00	28.25

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled.

	FINISHED STEEL	PIG IRON	SCRAP STEEL
Dec. 23, 1947	3.18925¢ per lb.	$37.06 per gross ton	$39.75 per gross ton
One week ago	3.18925¢ per lb.	$37.06 per gross ton	$39.75 per gross ton
One month ago	3.18925¢ per lb.	$37.06 per gross ton	$40.58 per gross ton
One year ago	2.75655¢ per lb.	$30.14 per gross ton	$31.17 per gross ton

	FINISHED STEEL HIGH	FINISHED STEEL LOW	PIG IRON HIGH	PIG IRON LOW	SCRAP STEEL HIGH	SCRAP STEEL LOW
1947	3.18925¢ Aug. 12	2.87118¢ Jan. 7	$37.35 Aug. 10	$30.14 Jan. 7	$42.58 Oct. 28	$29.50 May 20
1946	2.83599¢ Dec. 31	2.54490¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1941	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1940	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1939	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1938	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1937	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1936	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1935	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1934	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1933	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1932	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1931	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1930	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1929	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Finished steel: Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

Pig iron: Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Scrap steel: Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb & over, (9) Carload lot in manufacturing trade. (10) Delivered Los Angeles only. (12) Produced to dimensional tolerances in AISI Manual Sec. 6. (13) Delivered San Francisco only: includes 3 pct freight tax. (14) Kaiser Co. prices (15) to 0.035 to 0.075 in. thick by ¾ to 3½ in. wide. (17) Delivered Los Angeles: add ½¢ per 100 lb for San Francisco. (18) Slab prices subject to negotiation in most cases. Some producers charge (19) $2 more, (21) $1 more. Some producers charge (22) 0.05¢ less, (23) 0.10¢ less, (24) 0.20¢ less.

Basing Points	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio		San Franc'co, Los Angeles, Seattle	DELIVERED TO		
													Detroit	New York	Philadelphia
INGOTS Carbon, rerolling					($36.00 f. o. b. mill)		(Spot market as high as $86 to $90 gross ton)								
Carbon, forging	$48.00														
Alloy	$56.00									(Canton = $56.00)					
BILLETS, BLOOMS, SLABS Carbon, rerolling[18]	$45.00[19]	$45.00[19]	$45.00[19]	$47.00	$45.00[19]	$45.00[19]							$48.00[19]		
Carbon, forging billets	$55.00	$55.00	$55.00	$55.00	$55.00	$55.00							$58.00		
Alloy	$66.00	$66.00				$66.00	(Bethlehem, Massillon, Canton = $66.00)						$69.00		
SHEET BARS								Subject to negotiation							
PIPE SKELP	2.60¢[21]						2.60¢[21]								
WIRE RODS	2.80¢[21]	2.80¢[21]		2.80¢[21]	2.85¢		(Worcester = 2.90¢[21])					3.52¢[13]			
SHEETS Hot-rolled	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢		(Ashland, Ky. = 2.80¢)		3.54[17]¢	2.95¢	3.12¢	3.02¢
Cold-rolled[1]	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢	3.55¢		3.65¢	3.55¢			3.70¢	4.00¢	3.97¢
Galvanized (10 gage)	3.95¢[23]	3.95¢[23]	3.95¢[23]		3.95¢[23]		3.95¢	3.95¢	4.05¢	3.35¢	(Ashland = 3.95¢)	4.62¢[17]		4.27¢	4.17¢
Enameling (12 gage)	3.95¢[22]	3.95¢[22]	3.95¢[22]	3.95¢			3.95¢		4.05¢	3.95¢			4.10¢[22]	4.42¢	4.37¢
Long ternes[2] (10 gage)	4.05¢[24]		3.85¢											4.52¢	4.47¢
STRIP Hot-rolled[3]	2.80¢	2.80¢	2.80¢	2.80¢[15]	2.80¢		2.80¢					3.60¢[17]	2.95¢	3.27¢	3.22¢
Cold-rolled[4]	3.55¢	3.65¢	3.65¢	3.55¢			3.55¢			(Worcester = 3.75¢)			3.70¢	4.02¢	3.97¢
Cooperage stock	3.10¢	3.10¢			3.10¢		3.10¢							3.57¢	
TINPLATE Standard cokes, base box	$5.75	$5.75	$5.75		$5.85			$5.85	$5.85	(Warren, Ohio = $5.75)				$6.175	$6.074
Electro, box 0.25 lb.	Deduct 90¢ from standard coke base box price.														
0.50 lb.	Deduct 70¢ from standard coke base box price.														
0.75 lb.	Deduct 50¢ from standard coke base box price.														
BLACKPLATE, 29 gage[5]	3.90¢	3.90¢	3.90¢		4.00¢			4.00¢	4.00¢					4.32¢	4.22¢
BLACKPLATE, CANMAKING 55 lb. to 70 lb.	Deduct $1.55 from standard coke base box.														
75 lb. to 95 lb.	Deduct $1.65 from standard coke base box.														
100 lb. to 118 lb.	Deduct $1.55 from standard coke base box.														
TERNES, MFG., Special coated	Deduct 85¢ from standard coke base box price.														
BARS Carbon steel	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢					3.625¢[17]	3.05¢	3.35¢	3.32¢
Rail steel[6]	Subject to negotiation because of fluctuating scrap prices.														
Reinforcing (billet)[7]	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢				3.325¢[17]		3.07¢	2.97¢
Reinforcing (rail)	Subject to negotiation because of fluctuating scrap prices.														
Cold-finished[8]	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢							3.70¢	4.00¢	3.97¢
Alloy, hot-rolled	3.30¢	3.30¢	3.30¢			3.30¢	3.30¢	(Bethlehem, Massillon, Canton = 3.30¢)					3.45¢		3.45¢
Alloy, cold-drawn	4.10¢	4.10¢	4.10¢	4.10¢		4.10¢			(Canton = 4.10¢)				4.25¢		
PLATE Carbon steel[12]	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢		2.95¢	(Coatesville = 3.15¢, Claymont = 3.30¢, Geneva, Utah = 3.10¢) 2.95¢				3.838¢[14]		3.27¢	3.17¢
Floor plates	4.20¢	4.20¢	4.20¢											4.67¢	4.62¢
Alloy	3.80¢	3.80¢	3.80¢		(Coatesville = 4.50¢)									4.27¢	4.22¢
SHAPES, Structural	2.80¢	2.80¢	2.80¢		2.80¢	2.80¢	(Geneva, Utah = 2.95¢, Bethlehem = 2.80¢)					3.43¢[10]		3.02¢	2.95¢
SPRING STEEL, C-R 0.08 to 0.40 carbon	3.55¢			3.55¢			(Worcester = 3.75¢)								
0.41 to 0.60 carbon	5.05¢			5.05¢			(Worcester = 5.25¢)								
0.61 to 0.80 carbon	5.65¢			5.65¢			(Worcester = 5.85¢)								
0.81 to 1.05 carbon	7.15¢			7.15¢			(Worcester = 7.35¢)								
1.06 to 1.35 carbon	9.45¢			9.45¢			(Worcester = 9.65¢)								
MANUFACTURERS' WIRE[9] Bright	3.55¢	3.55¢		3.55¢	3.55¢		(Worcester = 3.65¢, Duluth = 3.60¢)					4.56¢[13]		3.99¢	3.97¢
Galvanized					Add proper size extra and galvanizing extra to Bright Wire Base										
Spring (high carbon)	4.60¢	4.60¢		4.60¢	(Worcester = 4.70¢, Duluth = 4.85¢)				(Trenton = 4.85¢)			5.28¢[13]		5.04¢	4.96¢
PILING, Steel sheet	3.30¢	3.30¢				3.30¢								3.75¢	3.72¢

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

	Chromium Nickel		Straight Chromium			
Basing Point	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila	Subject to negotiation			Subject to negotiation		
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt	Subject to negotiation			Subject to negotiation		
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	Subject to negotiation			Subject to negotiation		
Billets, P'gh, Chi, Canton, Watervliet, Syracuse, Balt., Beth	Subject to negotiation			Subject to negotiation		
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville, Beth, Brackenridge	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton, Brackenridge, Balt, Coatesville	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Sheets, P'gh, Chi, Middletown, Canton, Balt, Brackenridge	39.00	37.00	29.00	31.50	35.50	39.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.50	23.50	18.50	19.00	26.00	38.00
Strip, c-r, P'gh, Cleve, Jersey City, Reading, Canton, Youngstown, Balt, W. Leechburg	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila, Ft. Wayne, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton, W. Leechburg	32.46	30.30	23.80	24.34	34.62	56.26
Rod, h-r, Syracuse	27.05	25.97	20.02	20.56	24.34	29.75
Tubing, seamless, P'gh, Chi, Canton, Brackenridge, Milwaukee	72.09	72.09	.....	68.49	.....	.....

TOOL STEEL

*(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, Ohio)*

W	*Cr*	*V*	*Mo*	*Co*	*Base Per lb*
18	4	1	—	—	82¢
18	4	1	—	5	$1.29
18	4	2	—	—	93¢
1.5	4	1.5	8	—	59¢
6	4	2	6	—	63¢

High-carbon-chromium*	47¢
Oil hardening manganese*	26¢
Special carbon*	24¢
Extra carbon*	20¢
Regular carbon*	17¢

Warehouse prices on and east of Mississippi are 2¢ per lb. higher; west of Mississippi, 4¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
Field grade	4.50¢
Armature	4.80¢
Electrical	5.30¢
Motor	6.05¢
Dynamo	6.75¢
Transformer 72	7.25¢
Transformer 65	7.95¢
Transformer 58	8.65¢
Transformer 52	9.45¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb No. 1 O.H., per 100 lb	$2.75
Angle splice bars, 100 lb	3.25
(F.o.b. basing points)	*per 100 lb*
Light rails (from billets)	$3.10
Light rails (from rail steel), f.o.b. Williamsport, Pa.	3.45
	Base per lb
Cut spikes	4.85¢
Screw spikes	6.90¢
Tie plate, steel	3.05¢
Tie plates, Pittsburg, Calif.	3.20¢
Track bolts	7.00¢
Track bolts, heat treated, to rail roads	7.25¢

Basing points, light rails, Pittsburgh, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, St. Louis, Kansas City, Minnequa, Colo., Birmingham; tie plates alone—Steelton, Pa.: Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa.: Richmond.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.	$7.05	$14.10

CLAD STEEL

Base prices, cents per pound

Stainless-clad	*Plate*	*Sheet*
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa.	*24.00	*22.00
Nickel-clad 10 pct, f.o.b. Coatesville, Pa.	21.50	....
Inconel-clad 10 pct, f.o.b. Coatesville	30.00	....
Monel-clad 10 pct, f.o.b. Coatesville	29.00	....
Aluminized steel Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

---

* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Base per keg	*Delivered San Francisco*
Standard & coated nails	$4.25†	$5.33
Galvanized nails‡‡	4.00†	5.08
Cut nails, carloads, Pittsburgh base	5.80*	....

---

† 10¢ additional at Cleveland, 35¢ at Worcester. ‡‡ Plus $2.75 per 100 lb galvanizing extra. *Less 20¢ to jobbers.

	Base per 100 lb	
Annealed fence wire	$4.20‡	$5.21
Annealed galv. fence wire	4.65‡	5.66

‡10¢ additional at Worcester.

To the dealer f.o.b. Pittsburgh, Chicago, Birmingham

	Base	*column*
Woven wire fence*	91	114
Fence posts, carloads	90††	...
Single loop bale ties	91	115
Galvanized barbed wire**	101	121
Twisted barbless wire	101	...

---

* 15½ gage and heavier. ** On 80-rod spools in carload quantities. ††Pittsburgh, Duluth.

HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dynalloy	Hi Steel	Mayari R	Otiscoloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55
Sheets									
Hot-rolled	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
Cold-rolled	5.30	5.30	5.30	....	5.30	5.30	5.30	5.30	5.30
Galvanized	....	5.85	....	....	....	6.00	....	....	....
Strip									
Hot-rolled	4.30	4.30	4.30	....	4.30	4.30	4.30	4.30	4.30
Cold-rolled	....	....	5.30	....	....	5.30	5.30	5.30	5.30†
Shapes	....	4.30	....	....	4.30	4.30	4.30	4.30	....
Beams	....	4.30	....	....	....	4.30	....	....	....
Bars									
Hot-rolled	4.45	4.45	4.45	....	....	4.45	4.45	4.45	4.45
Bar shapes	....	4.45	....	....	4.45	4.45	4.45	4.45	....

† Pittsburgh, add 0.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts. f.o.b. Pittsburgh and Lorain, steel buttweld and seamless. Others f.o.b. Pittsburgh only
Base price, $200.00 per net ton

Standard, threaded & coupled

Steel, buttweld	Black	Galv,
½-in.	50½	34½
¾-in.	53½	38½
1-in.	56	41½
1¼-in.	56½	42
1½-in.	57	42½
2 in.	57½	43
2½ and 3-in,	58	43½
Wrought Iron, buttweld		
½-in.	+ 7	+29
¾-in.	2½	+19
1 and 1¼-in.	8	+11
1½-in.	13½	+ 7½
2-in.	14	+ 7
Steel, lapweld		
2-in.	49	34
2½ and 3-in.	52	37
3½ to 6-in.	54	39
Steel, seamless		
2-in.	48	33
2½ and 3-in.	51	36
3½ to 6-in.	53	38
Wrought Iron, lapweld		
2-in.	5½	+14½
2½ to 3½-in.	8	+10½
4-in.	12	+ 5
4½ to 8-in.	10	+ 6½

Extra Strong, plain ends

Steel, buttweld		
½-in.	49½	35
¾-in.	53½	39
1-in.	55½	42
1¼-in.	56	42½
1½-in.	56½	43
2-in.	57	43½
2½ and 3-in.	57½	44
Wrought Iron, buttweld		
½-in.	+ 2½	+23
¾-in.	3½	+17
1 to 2-in.	13	+ 7
Steel, lapweld		
2-in.	48	34
2½ and 3-in.	52	38
3½ to 6-in.	55½	41½
Steel, seamless		
2-in.	47	33
2½ and 3-in.	51	37
3½ to 6-in.	54½	40½
Wrought Iron, lapweld		
2-in.	8½	+11
2½ to 4-in.	17½	+ ½
4½ to 6-in.	13	+ 5

Basing discounts for standard pipe are for threads and couplings. For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies F.o.b. Gary prices are one point lower discount on all buttweld. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft, f.o.b. Pittsburgh in carload lots, cut length 4 to 24 ft, inclusive.

		Seamless		Electric Weld	
OD in in.	Gage BWG	Hot-Rolled	Cold-Drawn	Hot-Rolled	Cold-Drawn
2	13	$16.67	$19.99	$16.17	$19.39
2½	12	22.42	26.87	21.75	26.06
3	12	24.93	29.90	24.18	29.00
3½	11	31.17	37.39	30.23	36.27
4	10	38.69	46.38	37.53	44.99

CAST IRON WATER PIPE

	Per net ton
6-in. to 24-in. del'd Chicago	$86.12
6-in. to 24-in. del'd New York	84.18
6-in. to 24-in., Birmingham	74.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles for all rail shipment; rail and water shipment less	100.90

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

	Percent Off List
½ in. & smaller x 6 in. & shorter	45
9/16 & ⅝ in. x 6 in. & shorter	46
¾ in. & larger x 6 in. & shorter	43
All diam, longer than 6 in.	41
Lag, all diam over 6 in. long	44
Lag, all diam x 6 in. & shorter	46
Plow bolts	54

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller	43
9/16 to 1 in. inclusive	42
1⅛ to 1½ in. inclusive	40
1⅝ in. and larger	35

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	USS	SAE
7/16 in. and smaller		46
½ in. and smaller	44	..
½ in. through 1 in.		44
9/16 in. through 1 in.	43	..
1⅛ in. through 1½ in.	41	42
1⅝ in and larger	35	..

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts

Packages, nuts separate	65 and 10
In bulk	75

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets

(½ in. and larger)

	Base per 100 *lb*
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$5.65
F.o.b. Lebanon, Pa.	5.80

Small Rivets

(7/16 in. and smaller)

	Percent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	55

Cap and Set Screws

(In packages)	*Percent Off List*
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	53
¾ to 1 in. x 6 in., SAE 1035, heat treated	44
Set screws, oval points	56
Milled studs	29
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	37

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF_2 Content:	*Base price per short ton*
70% or more	$35.00
65% but less than 70%	34.00
60% but less than 65%	33.00
Less than 60%	32.00

LAKE SUPERIOR ORES

(51.50% *Fe, Natural Content, Delivered Lower Lake Ports)*

	Per Gross Ton
Old range, bessemer	$5.95
Old range, nonbessemer	5.80
Mesabi, bessemer	5.70
Mesabi, nonbessemer	5.55
High phosphorus	5.55

Prices quoted retroactive to Jan. 1, 1947

METAL POWDERS

Prices in cents per pound in ton lots, f.o.b. shipping point.

Brass, minus 100 mesh	24¢ to 28½¢
Copper, electrolytic, 100 and 325 mesh	30¢ to 31½¢
Copper, reduced, 150 and 200 mesh	29¢ to 30½¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe carlots	10¢ to 17¢
Swedish sponge iron, 100 mesh, c.i.f. N. Y., carlots, ocean bags	7.4¢ to 8.5¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots	5¢
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots	63¢ to 80¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe	35¢ to 37¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe	29¢ to 32¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe	90¢ to $1.75
Aluminum, 100, 200 mesh, carlots	23¢ to 26¢
Antimony, 100 mesh	36.05¢
Cadmium, 100 mesh	$2.0
Chromium, 100 mesh and finer	$1.025
Lead, 100, 200, & 300 mesh	18.50¢ to 23.50¢
Manganese, minus 325 mesh and coarser	49¢
Nickel, 100 mesh	51½¢
Silicon, 100 mesh	26¢
Solder powder, 100 mesh	8½¢ plus metal
Stainless steel, 302, minus 100 mesh	75¢
Tin, 100 mesh	90¢
Tungsten metal powder, 98%-99%, any quantity, per lb.	$3.05
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb.	$2.65
Under 100 lb	$2.90

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$12.00 to $13.00
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	13.50 to 14.50
Foundry, Byproduct	
Chicago, del'd	$18.60
Chicago, f.o.b.	17.50
New England, del'd	19.75
Seaboard, Kearney, N. J., f.o.b.	17.85
Philadelphia, del'd	17.83
Swedeland, Pa., f.o.b.	16.90
Buffalo, del'd	18.75
Ashland, Ohio, f.o.b.	15.50
Painesville, Ohio, f.o.b.	16.60
Erie, del'd	19.95
Cleveland, del'd	17.90
Cincinnati, del'd	18.59
St. Louis, del'd	18.03
Birmingham, del'd	15.76

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick

	Carloads, Per 1000
No. 1, Ohio	$67.00
First quality, Pa., Md., Ky., Mo., Ohio	73.00
First quality, New Jersey	78.00
Sec. quality, Pa., Md., Ky., Mo., Ohio	67.00
Sec. quality, New Jersey	70.00
No. 2, Ohio	59.00
Ground fire clay, net ton, bulk	10.50

Silica Brick

Pennsylvania and Birmingham	$73.00
Chicago District and Alabama	82.00
Silica cement, net ton (Eastern)	12.50
East Chicago	13.50

Chrome Brick

	Per Net Ton
Standard chemically bonded, Balt., Plymouth Meeting, Chester	$64.00

Magnesite Brick

Standard, Balt. and Chester	$86.00
Chemically bonded, Baltimore	75.00

Grain Magnesite

Domestic, f.o.b. Balt. and Chester in bulk	$46.50
Domestic, f.o.b. Chewelah, Wash., in bulk	24.00
in sacks	28.00

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk. Midwest; add 10¢; Missouri Valley; add 20¢	$11.05

WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	$4.47	$5.73	$5.82	$4.78	$5.68	$4.82	$4.55	$4.83	$5.53	$8.34	$8.44	$9.88	$9.95
New York	4.71	5.72[1]	6.11	5.03	5.86	5.06	4.75	5.02	5.57	8.40	8.50	9.92	10.02
Boston	4.76	5.63[12]	6.16[12]	4.76	6.73	5.11	4.82	4.98	5.83	8.62	8.72	9.98	10.08
Baltimore	4.31	....	5.71	4.76	....	4.76	4.68	4.81	5.51	....	....	....	....
Norfolk	4.80	....	....	5.20	....	5.05	5.05	5.10	5.90	....	....	....	....
Chicago	4.25	5.10	5.65	4.35	5.45	4.60	4.40	4.40	5.10	8.05	8.15	9.30	9.40
Milwaukee	4.429	5.279[1]	5.829	4.529	5.629[5]	4.779	4.579	4.579	5.279	8.379	8.479	9.629	9.729
Cleveland	4.25	[4.95	5.78	4.52	5.00	4.60†	4.65	4.40	5.10	8.33	8.43	9.30	9.49
Buffalo	4.25	5.10	6.00	4.70	5.65[5]	4.95	4.40‡	4.40‡	5.10	8.05	8.15	9.30	9.40
Detroit	4.35	5.20	6.02	4.72	5.63	4.88†	4.77	4.50	5.22	8.50	8.60	9.73	9.78
Cincinnati	4.51	5.19	5.74	4.74	5.70	4.95	4.79	4.75	5.45	....	....	....	....
St. Louis	4.58	5.43[1]	5.87	4.68	5.82	4.88	4.73	4.73	5.47	8.57	8.67	9.82	9.92
Pittsburgh	4.25	5.10[1]	5.65	4.35	....	4.60	4.40	4.40	5.10	8.05	8.15	9.30	9.40
St. Paul	4.63	5.48[1]	5.88[2]	4.73[7]	....	4.93[7]	4.78[7]	4.78[7]	5.91[6]	....	....	....	....
Omaha	5.165	.....	6.565	5.265	....	5.515	5.315	5.315	6.015	....	....	....	....
Indianapolis	4.553	5.324	5.874	4.653	5.763	4.903	4.703	4.703	5.403	....	....	....	....
Birmingham	4.45[11]	....	5.65	4.45[11]	....	4.65[11]	4.40[11]	4.40[11]	6.04	....	....	....	....
Memphis	4.82[11]	5.87[1]	6.37	5.02[11]	....	5.17[11]	4.97[11]	4.97[11]	5 87	....	....	....	....
New Orleans	*4.99[11]	6.28[1]	....	5.19[11]	....	5.34[11]	*5.04[11]	*5.14[11]	6.28[6]	....	....	....	....
Houston	5.30	....	6.60	5.25	....	5.35	5.15	5.30	6.80	9.40[17]	9.20[17]	10.35[17]	10.45[17]
Los Angeles	5.75	7.35[1]	7.40	6.05	8.70[5]	5.55	5.35	5.50	7.35[14]	9.55[15]	9.35[15]	10.95[15]	11.05[15]
San Francisco	5.40[8]	6.65	6.85	5.75[8]	....	5.50	5.20	5.05	7.50[10]	9.55[15]	9.35[15]	10.95[15]	11.05[15]
Seattle	5.45[4]	7.25[2]	6.85	5.60[4]	....	5.60[4]	5.25[4]	5.45[4]	7.45[14]	....	8.55[16]	....	11.15[16]
Portland	5.30[4]	7.10[2]	6.70	5.60[4]	....	5.45[4]	5.25[4]	5.55[4]	7.45[14]	....	....	....	....
Salt Lake City	6.40	....	7.85	6.70	....	6.20	6.35	6.55	7.55	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 450 to 1499 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) 1000 to 1999 lb.

* Add 46¢ for sizes not rolled in Birmingham.

† Up to ¾ in. thick and 90 in. wide.

‡ Add 35¢ for sizes not rolled at Buffalo.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

BASING POINT PRICES

Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	37.00	37.50	38.00	38.50	.....
Birmingham	32.88– 35.88	33.38– 36.38	.....	.....	.....
Buffalo	36.00– 39.50*	36.00– 40.00*	36.50– 40.50*	.....	.....
Chicago	35.50	36.00	36.50	37.00	.....
Cleveland	35.50– 39.25*	36.00– 39.75*	36.50– 40.25*	.....	.....
Duluth	36.00	36.50	37.00	37.50	.....
Erie	35.50	36.00	36.50	37.00	.....
Everett	.....	45.00	45.50	.....	.....
Granite City	36.50	37.00	37.00	.....	.....
Neville Island	36.00	36.50	36.50	37.00	.....
Provo	36.00	36.50	.....	.....	.....
Sharpsville	36.00	36.50	36.50	37.00	.....
Steelton	37.00	.....	.....	.....	42.00
Struthers, Ohio	36.50	.....	.....	.....	.....
Swedeland	41.00	41.50	42.00	42.50	.....
Toledo	35.50	36.00	36 50	37.00	.....
Troy, N. Y.	37.00	37.50	38.00	38.50	42.00
Youngstown	36.00	36.50	36.50	37.00	.....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	45.50	46.00	.....	.....
Boston	Steelton	5.30	.....	.....	.....	.....	47.30
Brooklyn	Bethlehem	3.30	40.30	40.80	41.30	41.80	.....
Cincinnati	Birmingham	5.36	38.24– 41.25	38.74– 41.74	.....	.....	.....
Jersey City	Bethlehem	2.02	39.02	39.52	40.02	40.52	.....
Los Angeles	Provo	6.53	42.53	43.03	.....	.....	.....
Mansfield	Cleveland-Toledo	2.56	38.06– 41.81*	38.56– 42.31*	39.06– 42.81*	39.56	.....
Philadelphia	Bethlehem	1.84	38.84	39.34	39.84	40.34	.....
Philadelphia	Swedeland	1.11	42.11	42.61	43.11	43.61	.....
Philadelphia	Steelton	2.38	39.38	.....	.....	.....	44.38
San Francisco	Provo	6.53	42.53	43.03	.....	.....	.....
Seattle	Provo	6.53	42.53	43.03	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	37.25	37.75	37.75	.....	.....

---

* Republic Steel Corp. price. Basis: Average price of No. 1 hvy. mlt. steel scrap at Cleveland or Buffalo respectively as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—$45.50; f.o.b. Buffalo—$46.75. Add $1.25 per ton for each additional 0.50 pct Si, up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorous $50.00 per gross ton, f.o.b. Lyles, Tenn. Delivered Chicago, $56.04. High phosphorous charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockwood, Tenn.

Carload lots (bulk)	$145
Less ton lots (packed)	189
Delivered Pittsburgh	151

$1.80 for each 1% above 82% Mn; penalty, $1.80 for each 1% below 78%.

Briquets

Cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk	8.70	8.95	9.50
Ton lots	10.30	10.90	12.80
Less ton lots	11.20	11.80	13.70

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$46.00	$47.00
F.o.b Pittsburgh	50.00	51.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	32
L.c.l. lots	34

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	32
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.07% max. C. 0.06% P. 90% mn.	23.00	24.85	26.05
0.10% max. C	22.50	24.35	25.55
0.15% max. C	22.00	23.85	25.05
0.30% max. C	21.50	23.35	24.55
0.50% max. C	21.00	22.85	24.05
0.75% max. C. 7.00% max. Si	18.00	19.85	21.05

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload, bulk	7.80
Ton lots	9.45

Briquets

Contract basis, carlots, bulk freight allowed, per lb of briquet	8.75
Ton lots	10.35
Less ton lots	11.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50%, $73.00 f.o.b. Keokuk, Iowa; $73.75 f.o.b. Niagara Falls; $70.75, f.o.b. Jackson, Ohio. Electric furnace silvery iron is not being produced at Jackson. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add 50¢ per ton for each 0.50 pct Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.

	Eastern	Central	Western
96% Si, 2% Fe	16.90	17.50	18.10
97% Si, 1% Fe	17.30	17.90	18.50

Silicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination. 40% Si. 1 lb Si briquets.

	Eastern	Central	Western
Carload, bulk	5.25	5.50	5.70
Ton lots	6.85	7.45	7.75
Less ton lots	7.75	8.35	8.65

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
25% Si	15.50	....	....
50% Si	9.30	9.80	10.00
75% Si	11.80	12.10	12.85
85% Si	13.30	13.60	14.35
90% Si	15.00	15.30	16.00

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	26.50	26.90	27.00
0.10% C	26.00	26.40	26.50
0.15% C	25.50	25.90	26.00
0.20% C	25.25	25.65	25.75
0.50% C	25.00	25.40	25.50
1.00% C	24.50	24.90	24.75
2.00% C	24.25	24.65	24.75
65-69% Cr, 4-9% C	18.60	19.00	19.15
62-66% Cr. 4-6% C. 6-9% Si.	18.60	19.00	19.15

Briquets

Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk	12.50	12.75	12.85
Ton lots	14.00	14.90	15.50
Less ton lots	14.90	15.80	16.40

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S M Ferrochrome

Contract price, cents per pound chrominum contained, lump sie, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	19.70	20.10	20.25
Ton lots	21.85	23.15	23.95
Less ton lots	23.35	24.65	25.45

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

	Eastern	Central	Western
Carload	25.00	25.40	25.50
Ton lots	27.30	27.95	29.15
Less ton lots	29.10	29.75	30.95

Chromium Metal

Contract prices, cents per lb, chromium contained, carload, packed, f.o.b. shipping point, freight allowed, 97% min. Cr, 1% max. Fe.

	Eastern	Central	Western
0.20% max. C	97.00	98.50	99.75
0.50% max. C	93.00	94.50	95.75
9.00% min. C	91.50	93.00	94.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	16.25	16.75	18.80
Ton lots	19.35	20.10	22.25
Less ton lots	20.85	21.60	23.75

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	17.50	18.00	20.05
Ton lots	19.80	20.65	22.40
Less ton lots	20.80	21.65	23.40

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.

	Cast	Turnings	Distilled
Ton lots	$1.85	$2.70	$3.40
Less ton lots	2.20	3.05	4.20

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr. 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

	Eastern	Central	Western
Ton lots	18.00	19.10	21.05
Less ton lots	19.25	20.35	22.30

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn. 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

	Eastern	Central	Western
Ton lots	15.75	16.85	18.80
Less ton lots	17.00	18.10	20.05

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant Niagara Falls, Washington, Pa. York, Pa., per pound contained W, 5 ton lots, freight allowed	$2.25
Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.	
Openhearth	$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2	$1.20
Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb	
Ton lots	$2.50
Less ton lots	$2.55
Ferromolybdenum, 55-75%, f.o.b Langeloth, Washington, Pa., per pound contained Mo.	95¢
Calcium molybdate, 40-45%, f.o.b Langeloth, Washington, Pa., Per pound contained Mo.	80¢
Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo	80¢
Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo	80¢
Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y. ton lots, per pound contained Ti	$1.23
Less ton lots	$1.25
Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti	$1.35
Less ton lots	$1.40
High carbon ferotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton	$142.50
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. (Siglo) Tenn., $3 unitage per gross ton	$65.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	18.40¢
Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy	
Carload, bulk	6.00¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	6.90¢
Ton lots	7.40¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Car lots	9.00¢
Ton lots	9.75¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

	Eastern	Central	Western
100 lb or more	$1.20	$1.23	$1.21

Manganese — Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max C.

Ton lots	$1.89	$1.903	$1.935
Less ton lots	2.01	2.023	2.044

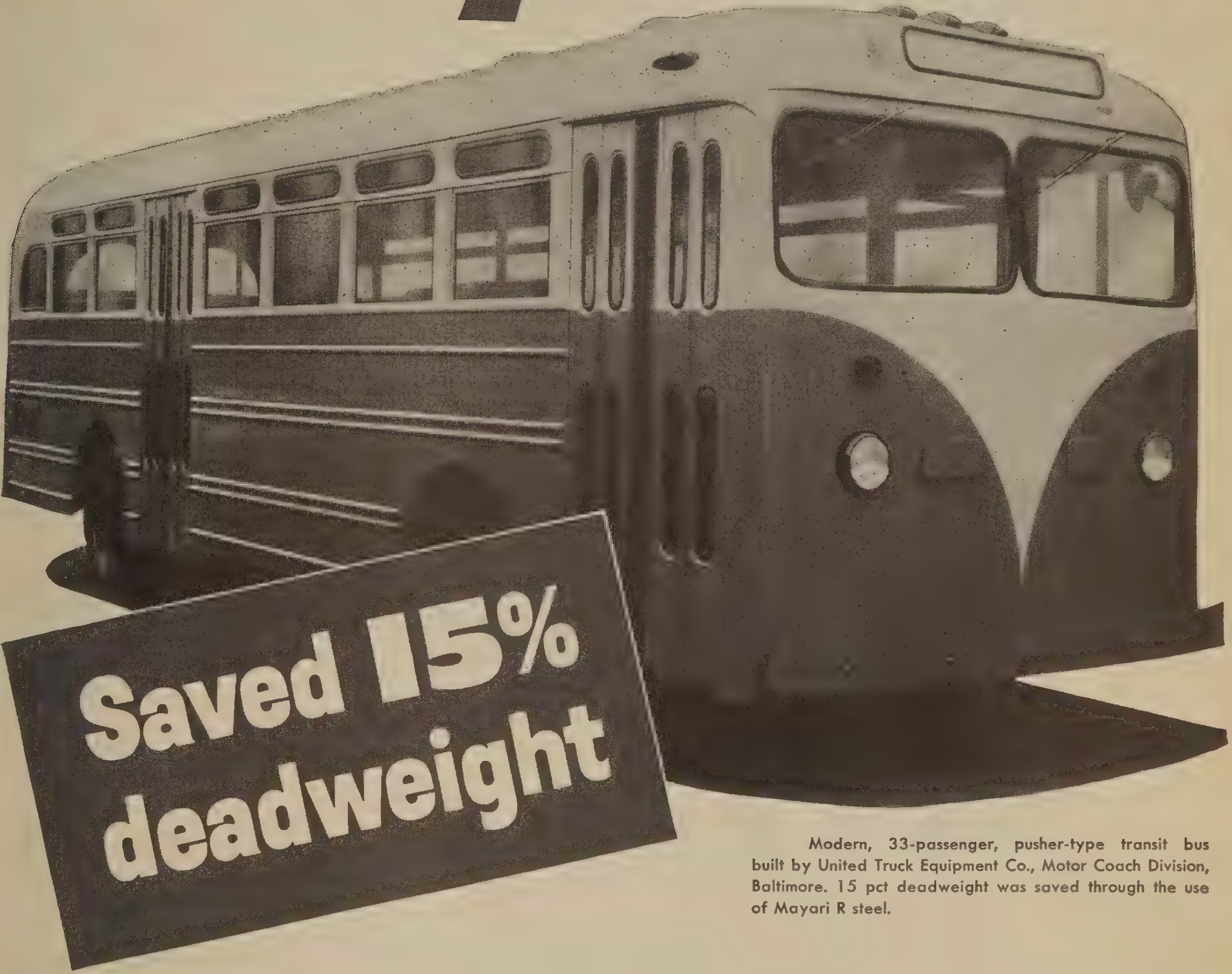
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots	$1.80	$1.8125	$1.8445

Silcaz, contract basis, f.o.b. plant freight allowed, per pound.	
Carload lots	39.00¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed on 50 lb and over	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Bortram, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b., Suspension Bridge, N. Y., freight allowed, Ti 15—17%, B 0.90—1.15%, Si 2.5—3.0% Al 1.0—2.0%.	
Ton lots, per pound	8.0¢

Illinois U Library

Mayari R



Modern, 33-passenger, pusher-type transit bus built by United Truck Equipment Co., Motor Coach Division, Baltimore. 15 pct deadweight was saved through the use of Mayari R steel.

This 33-passenger transit bus is built of Mayari R low-alloy, high-tensile steel. It was designed to weigh approximately 15 pct less than a similar vehicle built of ordinary carbon steel.

The builders considered several materials. They found that Mayari R has a combination of mechanical properties that permit the high working stresses needed for light-weight construction. They studied its resistance to atmospheric corrosion, to abrasion, and to denting. They took into account its longer paint-life. Weighing all of these factors, they selected Mayari R as an economical, dependable material well suited for their use in the highly-competitive bus-building field.

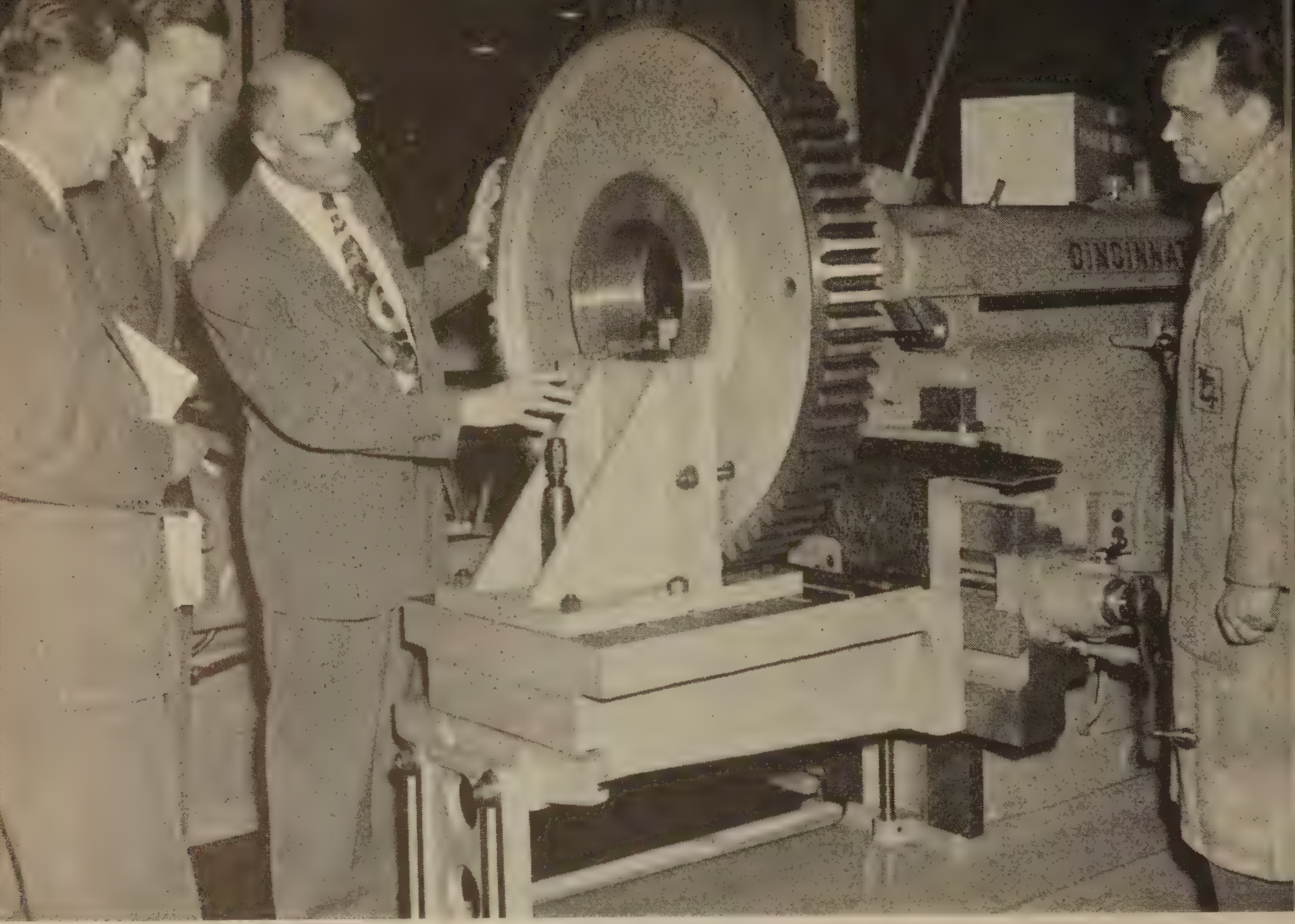
Mayari R is versatile steel widely used by the automotive industry for bus, truck and trailer frames, body members, flooring, sides and impact bars. For more complete information on the properties, workability and applications of this steel, write for Catalog 209.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

★ BETHLEHEM STEEL ★

Mayari R *makes it lighter...stronger...longer lasting*



* Demonstration at Machine Tool Show, Chicago.

HANDY!

There is always another job you can do on a Cincinnati Shaper—*"the handy man of industry"*. Planing, contouring, keywaying, angular work, internal shaping—all are regularly done with simple tooling and quick setups.

With the use of practical and inexpensive accessories, many awkward and unusual jobs are done simply and economically along with the regular work.

When you put a Cincinnati Shaper on the floor, that floor space pays dividends.

Write for catalog N-3.

* Cutting keyways in these large gears—which were both heavy and awkward—was done on a Cincinnati Heavy Duty Shaper equipped with a table with removable top, a boom crane, and a simple, inexpensive fixture. Can we help you with your special job?

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO U.S.A.

SHAPERS · SHEARS · BRAKES

Shears cutting armor plate, 300-400 Brinell. Holddowns are hydraulically operated. Wherever used, *Texaco Regal Oils (R & O)* keep hydraulic systems free of rust, sludge and foam, prevent costly stoppages.

Photo courtesy of The Cincinnati Shaper Co.

A "DEFINITELY BETTER" WAY... to prevent rust and sludge in hydraulic systems

DON'T let improper hydraulic fluid plug up your hydraulic mechanisms — keep them free of rust and sludge by using *Texaco Regal Oils (R & O)*. These are turbine-grade oils effectively inhibited against rust and oxidation (the cause of sludge), and specially processed to prevent foaming.

From plants everywhere come reports of lower maintenance costs and smoother hydraulic operation for longer uninterrupted periods with *Regal Oils (R & O)*. As one user expresses it, "They are definitely better than other oils."

Texaco Regal Oils (R & O) are recommended by leading hydraulic equipment manufacturers—many of whom ship their units already filled with them.

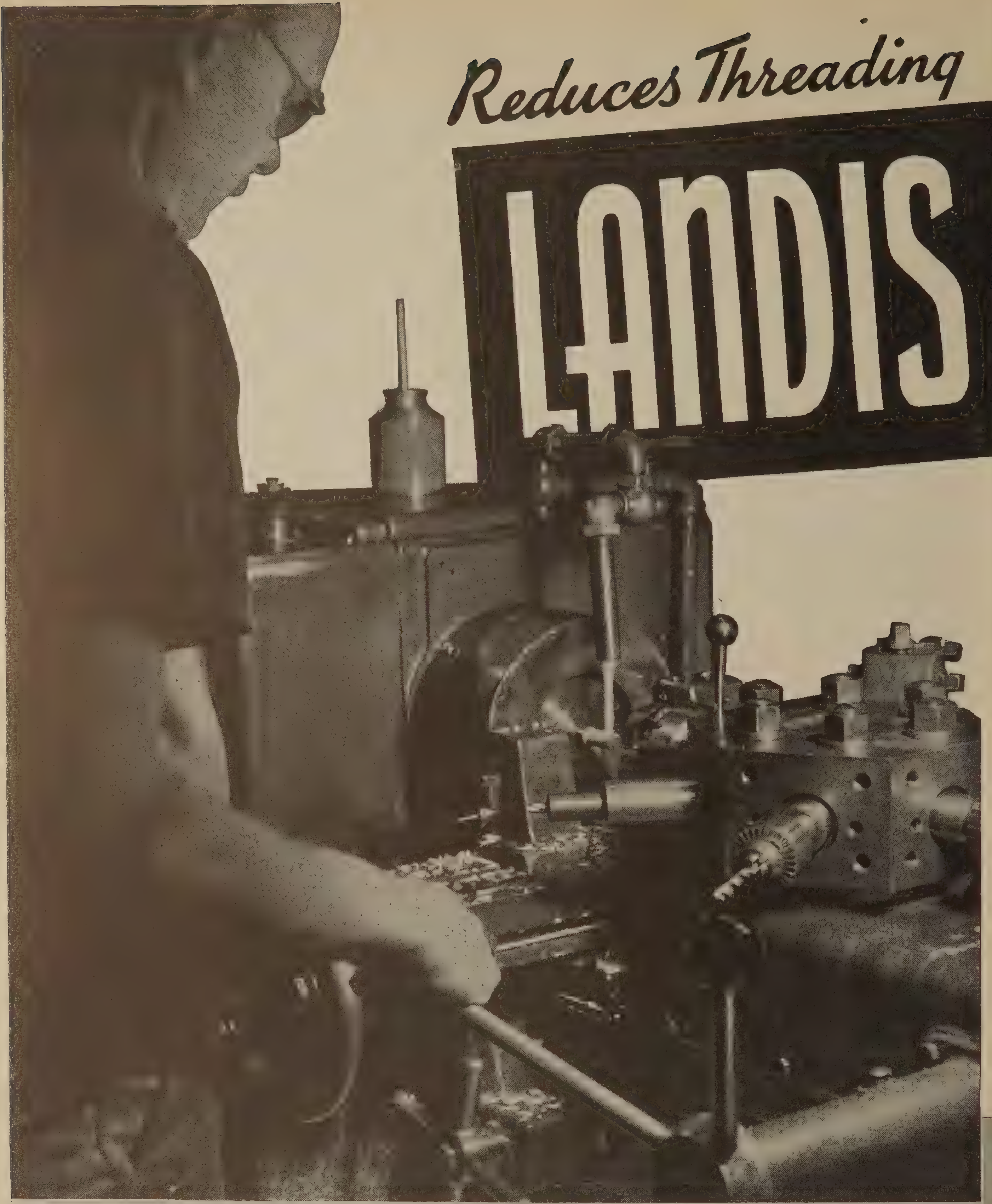
Whatever the type or size of your hydraulic units, there are *Texaco Regal Oils (R & O)* in the suitable viscosities to assure their efficient operation. For full information, call the nearest of the more than 2500 Texaco distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, New York.

TEXACO T REG. T.M.

TEXACO Regal Oils (R&O)

FOR ALL HYDRAULIC UNITS

TUNE IN . . . TEXACO STAR THEATRE presents the TONY MARTIN SHOW every Sunday night. • METROPOLITAN OPERA broadcasts every Saturday afternoon.

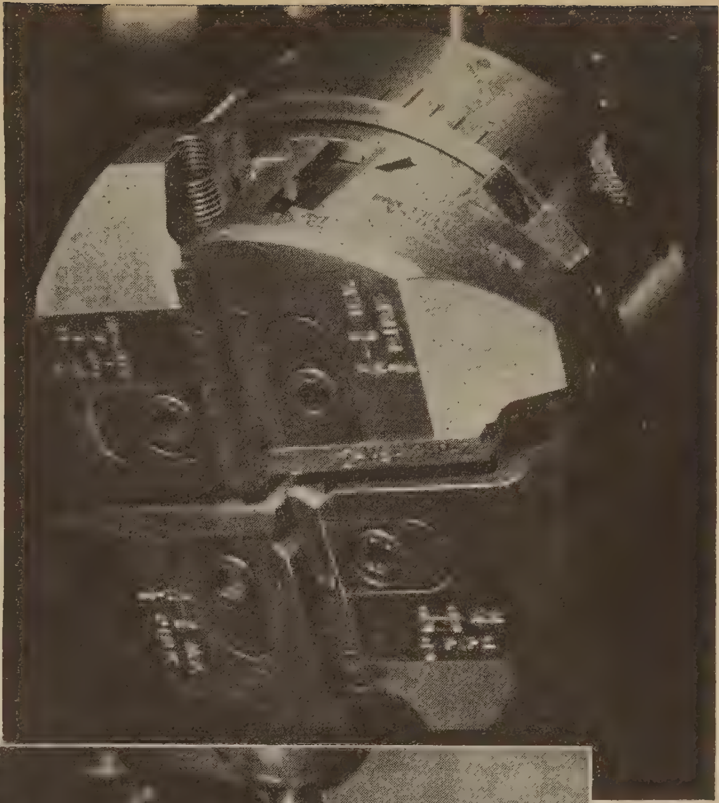

Reduces Threading
LANDIS

THREADING
AND ROLLING
MACHINES

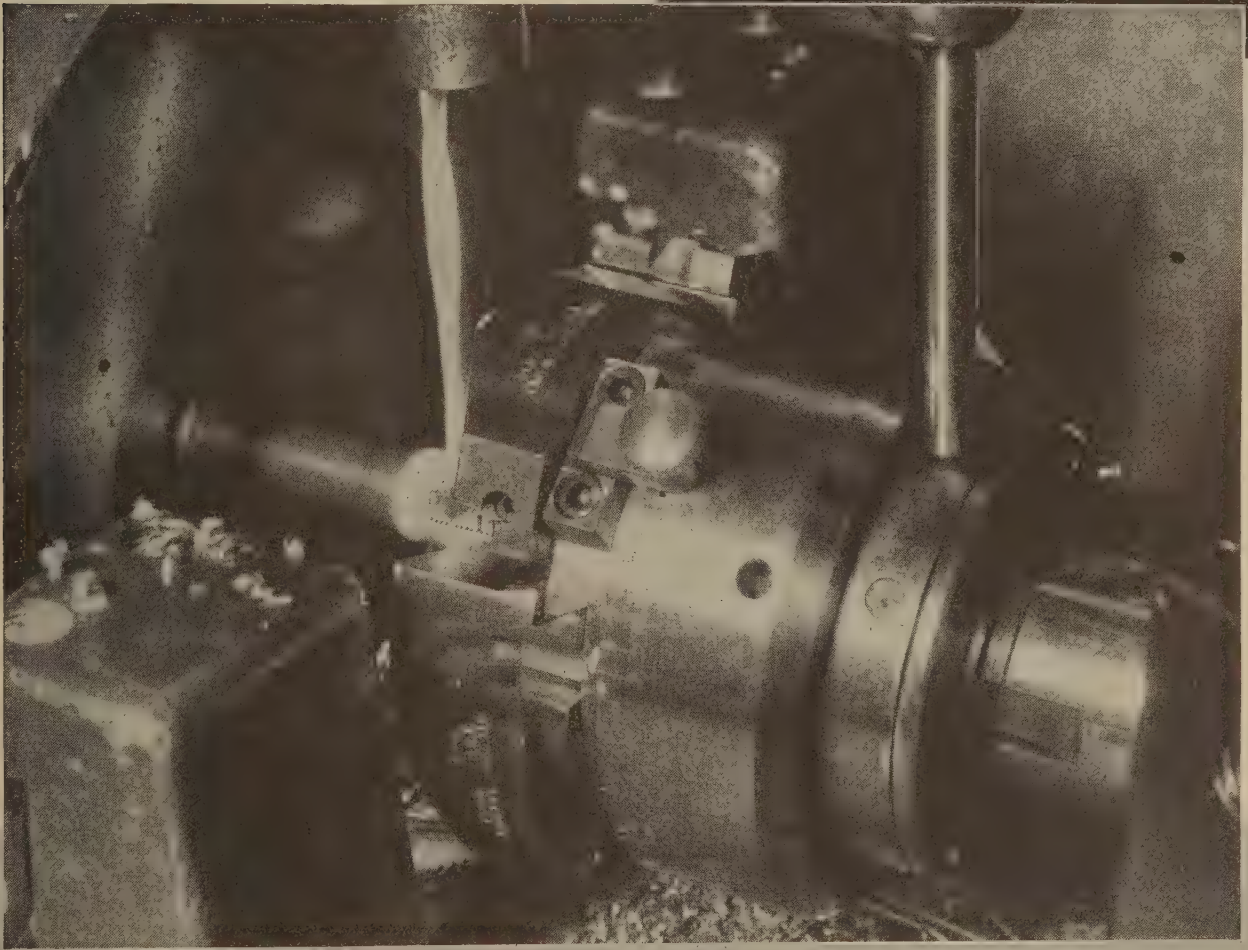
LANDIS
WAYNESBORO

Time and Cost

DIE-HEADS



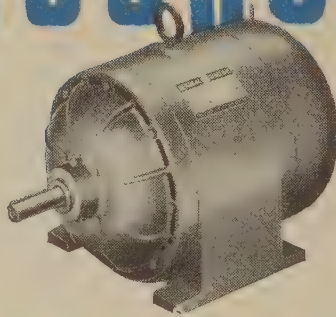
Submit your threading problems to our engineers for recommendations.



MACHINE CO.
PENNA., U. S. A.

DIE HEADS
TAPS · CHASERS
GRINDERS

5 BILLION MOTOR HOURS



PROVE YOU CAN'T BEAT

TRI/CLAD

EXTRA PROTECTION

Announcement of the Tri-Clad motor, back in 1940, ushered in a new concept of general-purpose motor design. Substantially increased horsepower-per-frame-size was one feature. Smarter appearance was another. But what really sold more than a million Tri-Clad motors is the *extra protection* we built into them. Figured conservatively, they have delivered more than 5 billion hours of service.

Today, with the "family" including dripproof motors, vertical motors, gear-motors, capacitor-motors, and totally enclosed motors, the Tri-Clad motor is, more than ever, the motor that means basic protection, dependable performance, and minimum upkeep. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

EXTRA PROTECTION ... AGAINST PHYSICAL DAMAGE!

Rigid cast-iron frame and end shields protect vital parts from external abuse and prevent resonance. Because they're not at the mercy of a coat of paint, they strongly resist chemical attack and dampness. Cast iron also gives you tight, *metal-to-metal* fits between end shields and frame.

EXTRA PROTECTION ... AGAINST ELECTRICAL BREAKDOWN!

Windings of Formex* wire, together with improved insulating materials, reduce the chances of electrical failure. Heat is dissipated quickly —motor stays young for years and years.

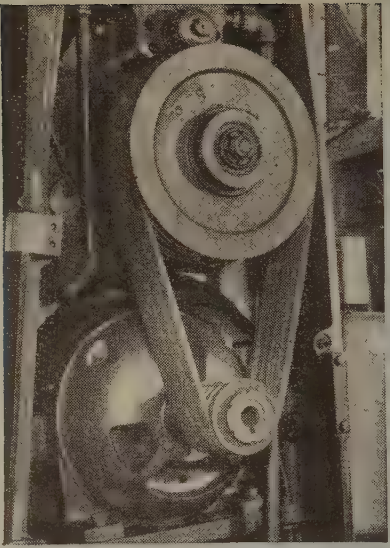
EXTRA PROTECTION ... AGAINST OPERATING WEAR AND TEAR!

Bearing design affords longer life, greater capacity, improved lubrication features. Bearing seals retain lubricant, keep out dirt. One-piece, cast-aluminum rotor is practically indestructible.

Trade-mark reg. U.S. Pat. Off.

GENERAL ELECTRIC

750-286C



5 YEARS IN "SOLITARY"

Many machine tools in the Bell Aircraft plant at Buffalo have pioneer Tri-Clad motors tucked away inside. The result is a sleek exterior for the machine and valuable floor space saved. During the war, when time was short and uninterrupted protection was of utmost importance, these motors gave dependable service, demanding only a minimum of maintenance and inspection. The Tri-Clad motor you see here driving a milling machine has not been removed for five years. It has done its job faithfully despite the strain of a 3-shift, 7-day work schedule, and along with 200 other Tri-Clad motors in the Bell plant, gives every sign of staying on the job indefinitely.

NOW—PEAK MOTOR TOUGHNESS

The Tri-Clad totally enclosed, fan-cooled motor is designed for use in adverse atmospheres — in iron dust, out-of-doors, in hazardous areas, and chemical atmospheres. It gives you these important construction features:

- A cast-iron, double-wall frame which completely encloses and protects windings and punchings.
- A nonshrinking compound around motor leads which protects motor interior from dust and moisture.
- A rotating labyrinth seal which further protects the motor interior from damage by foreign matter.

TRI/CLAD

REG. U.S. PAT OFF

MOTORS

The WEAN ENGINEERING *Company, Inc.*

WARREN, OHIO

OLYTIC COATING UNIT
TIN PLATE FLYING SHEAR LINE
CONTINUOUS STRIP PICKLING
MULTIPLE STRIP SLITTING
WEAN
SHEET FLYING SHEAR LINE
WEAN

To better serve the requirements of the trade and to operate at a profit in a highly competitive field, steel plant executives recognize they must have the most modern and efficient equipment available.

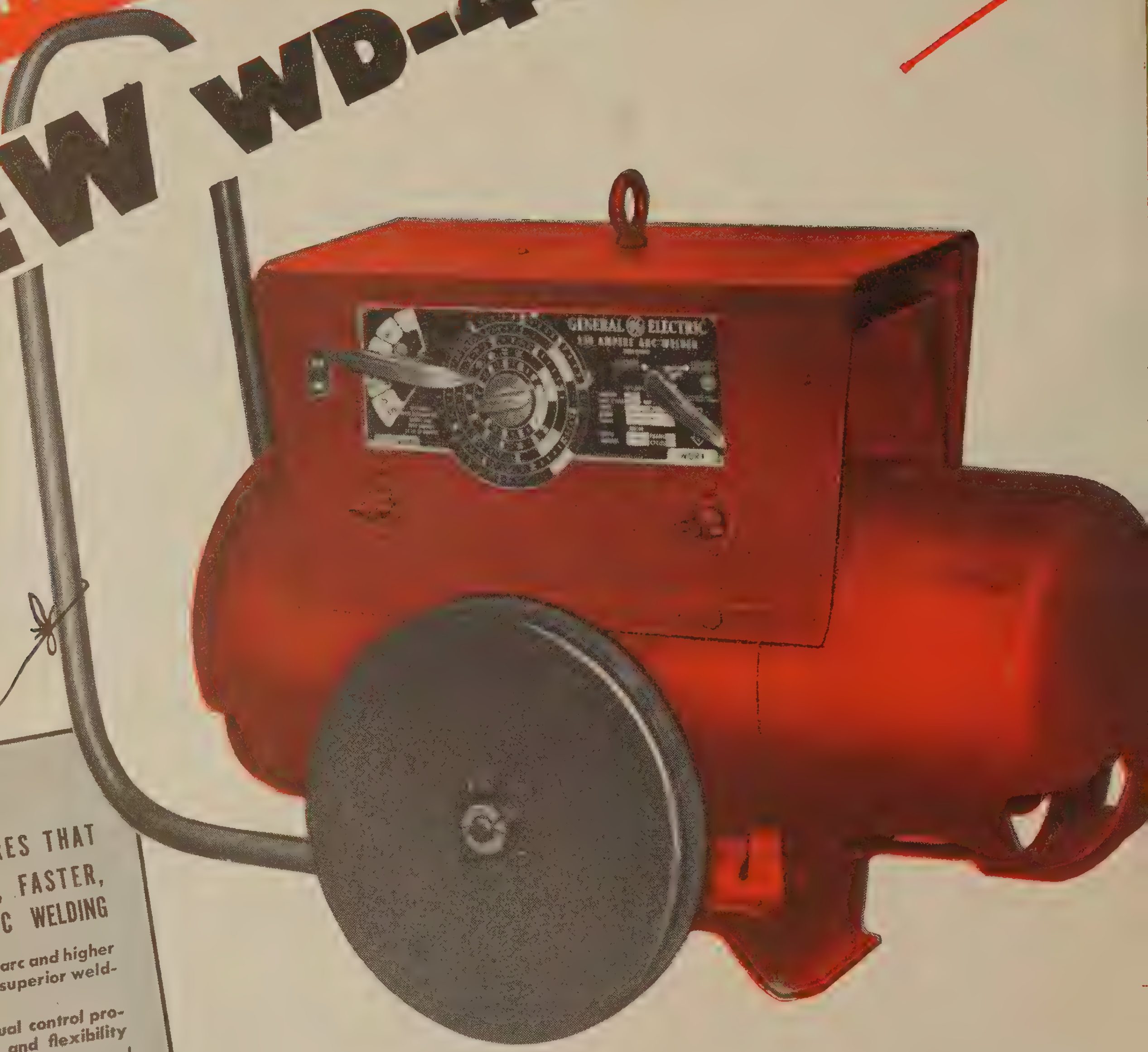
The Wean Engineering Company, Inc., Warren, Ohio, is the recognized leader in the design and installation of sheet, tin and strip mill equipment, whether it be one piece or a complete unit.

Many steel mill executives, both in this country and abroad, have recognized the advantages and efficiency of WEAN SHEET, STRIP AND TIN MILL EQUIPMENT. The same recognized advantages are available for overcoming your problems.

SPECIALISTS IN SHEET, STRIP AND TIN MILL EQUIPMENT

OR BETTER D-C WELDING

NEW WD-40 D-C WELDE



5 BIG FEATURES THAT MEAN EASIER, FASTER, LOWER-COST D-C WELDING

1. Snappy, stable arc and higher efficiency assure superior welding performance
2. Single-dial dual control provides precision and flexibility
3. 50% savings in size and weight for greater portability
4. Dependable low-cost service over a long "life-span"
5. Easy, inexpensive maintenance

• Outstanding welding performance and service is the hallmark of General Electric's new WD-40 series of heavy-duty industrial welders. Operating at 3500 rpm, these full-capacity NEMA-rated machines provide the same advantages of durability and minimized maintenance long associated with G-E welders; in addition, their welding performance is superior in many ways. The arc is easily struck and maintained, and steady welding current is provided over a broad current range.

Available in 200-, 300-, and 400-ampere ratings, the WD-40 line is described in detail in bulletin GEA-4852; ask your G-E Arc-welding Distributor for your copy.

"A-C or D-C . . . there's G-E arc-welding equipment for virtually every application!"

GENERAL ELECTRIC

673-70

Plus
THESE EASY-TO-USE ELECTRODES

W-32—*for welding formerly "hard-to-weld" steels*—a lime-ferritic electrode especially developed for production welding of cold-rolled, high-carbon, and high-sulphur steels, and steels of high hardenability which are susceptible to underbead cracking. Stable arc characteristics provide good directional control.

Other W-32 CHARACTERISTICS: Elimination of underbead cracking on hardenable steels.

Substantial reduction of hydrogen content of the weld metal produces welds that *can be successfully enameled without heat treatment.*

Marked decrease in tendency for surface holes to occur when base metal is high in sulphur content.

Excellent appearance of finished welds.

Spatter is minimized, deposition efficiency is high, and penetration is adequate but not excessive; reverse polarity d-c or a-c.

W-94—This recently introduced electrode is particularly designed to provide unusual resistance to shock and severe abrasion. Operating on either reverse polarity d-c, or a-c, its deposits will work-harden to a minimum of 50 Rockwell C scale.

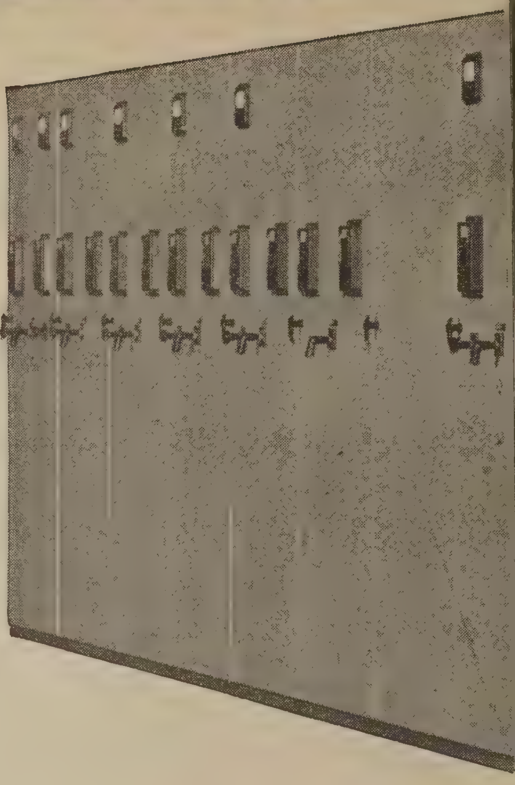
Many other special-purpose electrodes are also available.

STAINLESS STEEL—Whatever your stainless application, you'll likely find an electrode to do the job better from among the complete G-E line of 27 types of stainless steel electrodes—available in two coatings, lime-type for d-c operation and titania-type for a-c or d-c.

While comprising only a part of the complete line of General Electric arc-welding equipment, electrodes, and accessories, WD-40 welders and these electrodes are designed to provide *maximum performance* on those welding applications for which d-c is best suited. Call your *G-E Arc-welding Distributor* for a demonstration—of these, or anything else in the G-E welding line. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

Install *AIR BLAST* Metal-Clad

PLAY IT SAFE!



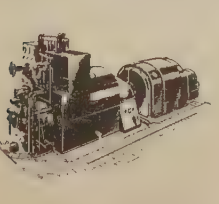
Guard Against Damage to Valuable Mill Equipment • Protect Rolling Mill Motors by Rapid Clearing of Faults • Provide Complete Safety for Your Men • Install Factory-Built, Factory-Wired Allis-Chalmers Metal-Clad Switchgear with *Air Blast* Circuit Breakers!

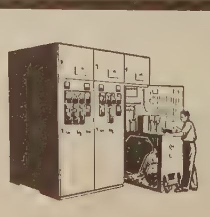
THIS IS THE *ONLY* DRAWOUT VERTICAL LIFT METAL-CLAD SWITCHGEAR equipped with *Air Blast* circuit breakers! That means a space-saving lineup of switchgear that is easily inspected and maintained . . . centralizes power control . . . protects personnel . . . and reduces potential fire hazards.

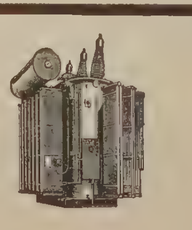
Drawout construction permits ready access to circuit breakers during inspection and maintenance—and interrupting with air blast reduces arcing time to less than a cycle insuring long contact life. *Air Blast* breakers are mechanically strong to withstand repeated "closing-opening" operations. *They consistently complete interruption within four to five cycles!* These 7.5 and 15 kv units have interrupting capacities of 250,000 and 500,000 kva.

For more information, contact your nearby A-C office, or write for *new* bulletin 18B6760. ALLIS-CHALMERS, MILWAUKEE 1, WIS.

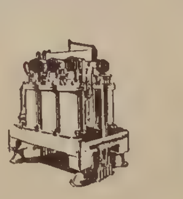
Regulex and *Texrope* are Allis-Chalmers trademarks

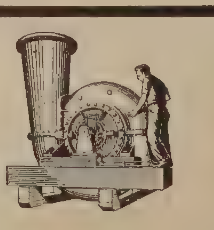


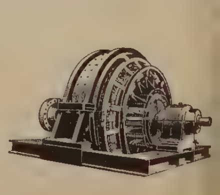




POWER & ELECTRICAL — Steam Turbines, Condensers, Water Conditioning, Power Transformers, Switchgear, Unit Substations, Circuit Breakers...

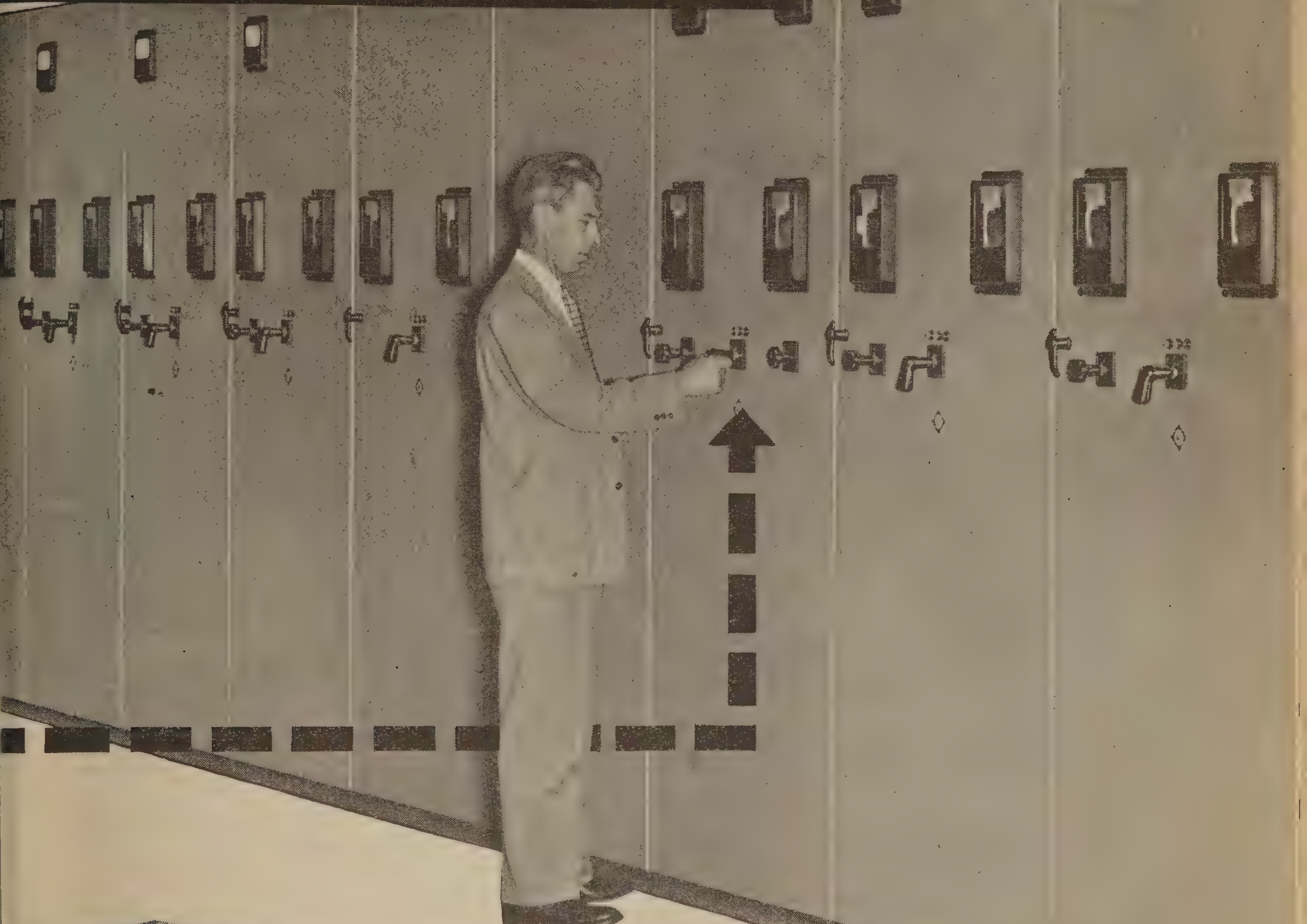


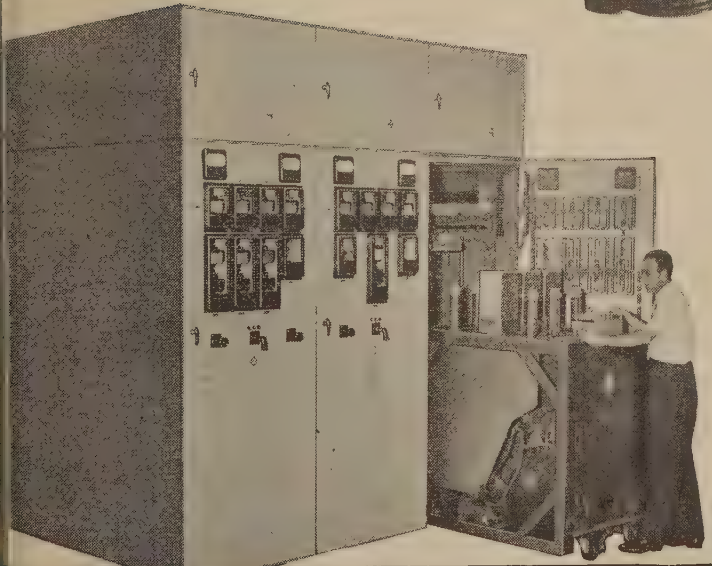




UTILIZATION & PROCESS — Motors, Blowers, Rectifiers, M-G Sets, Betatron, Pumps, Compressors, *Regulex* Exciters, *Texrope* V-Belt Drives . . .

Switchgear and . . .





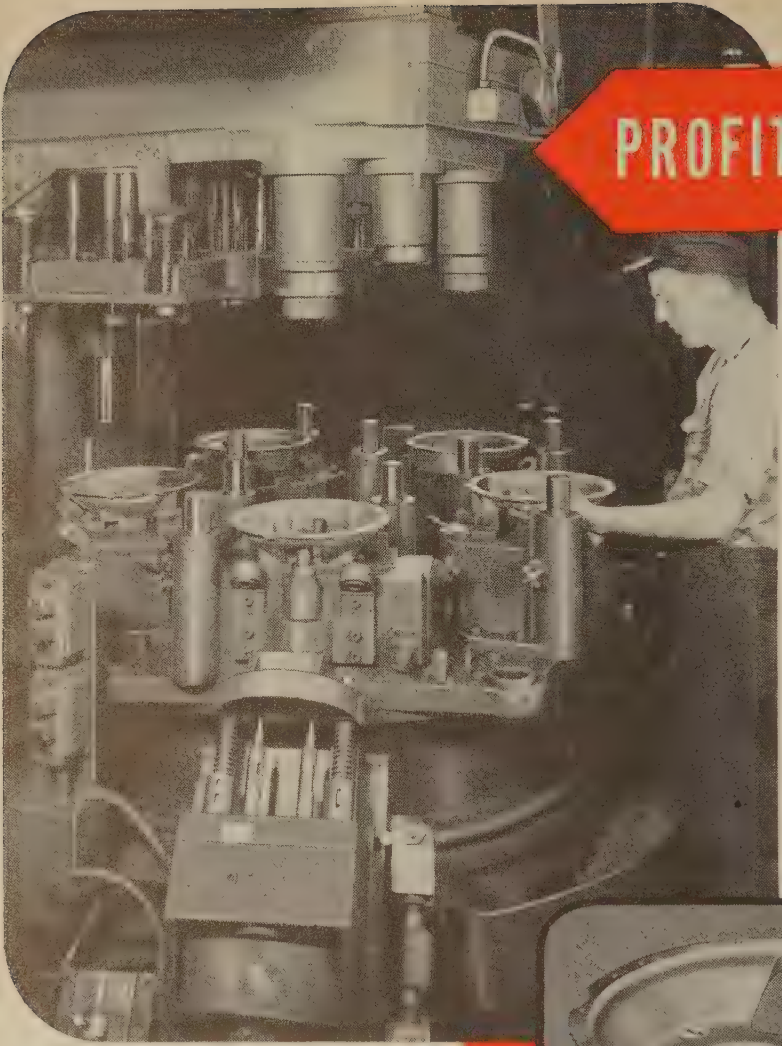
MAINTENANCE IS EASY . . . FAST . . . SAFE!

Lower breaker to floor by means of electrically operated motor-lift . . . pull it from structure . . . and roll it away to convenient test stand—that's all it takes! Breaker cannot be lowered when in the closed position because of positive interlocks . . . and automatic shutters prevent accidental contact with live parts — that's added safety for personnel during inspection and maintenance!

A 2360

ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products



PROFITABLE PERFORMANCE

WITH THIS BAUSH 3-WAY MULTI-SPINDLE MACHINE

Yes, profitable performance from every Baush machine has been our ideal in more than 50 years of designing and building special purpose multi-spindle and multi-operation machine tools.

If your equipment is outmoded, or does not meet today's demands for quality machining at high speed and low production cost — a Baush engineer will be glad to go over your machining problems.

Write, wire or phone us today.

Part being machined: Clutch Housing

Unit illustrated is a Baush Special 3-Way Hydraulic Multi-Spindle Drilling and Tapping Machine:

OPERATIONS:

Drill and ream flange holes —
Rough and finish bore the main bore —
Rough and finish bore starter hole —
Drill and spot face 6 holes in rear —
Drill and tap 2 angular pad holes.

PRODUCTION RATE:

Approximately 60 clutch housings — or 1320 operations per hour — at 75% efficiency.

Consists of welded steel base with ample chip trough —

1 — Vertical (36) spindle fixed center head mounted on hydraulic slide with dwell in feed —
Spindles: 4 — Special heavy-duty boring,
20 — No. 1 M.T. with nose adjustment,
6 — No. 2 M.T. with nose adjustment,
6 — No. 3 M.T. with nose adjustment.

1 — Auxiliary angular drilling unit on hydraulic slide —

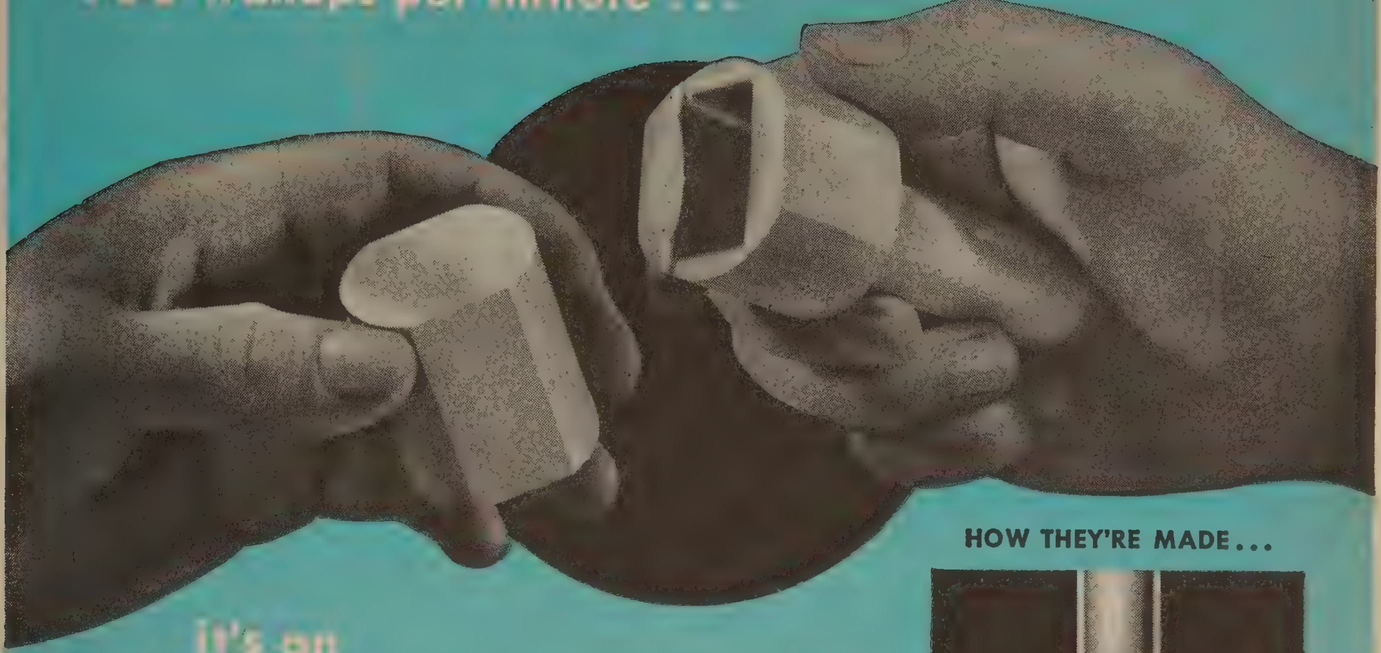
1 — Auxiliary angular tapping unit on hydraulic slide — Both drilling and tapping units have a fixed center head and are furnished with 2 spindles with nose adjustment.

MOTORS:

1—50 H.P., 1800 R.P.M. for vertical head spindle drive
1 — 5 H.P., 1200 R.P.M. for hydraulic feed of vertical head
1 — 1 H.P., 1200 R.P.M. for auxiliary drill unit spindle drive
1 — ½ H.P., 1800 R.P.M. for auxiliary tapping unit spindle drive
1 — 3 H.P., 1200 R.P.M. for hydraulic feed of auxiliary units and hydraulic rotating table.
1 — 50" diameter rotating table; six stations hydraulically operated with 5 holding fixtures mounted on a sub plate.

BAUSH
MACHINE TOOL CO.
SPRINGFIELD 7, MASSACHUSETTS

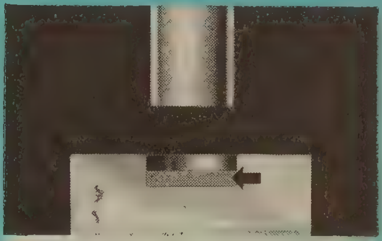
Made in one wallop to withstand 900 wallops per minute . . .



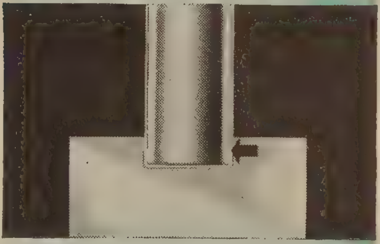
it's an

ALCOA IMPACT EXTRUSION

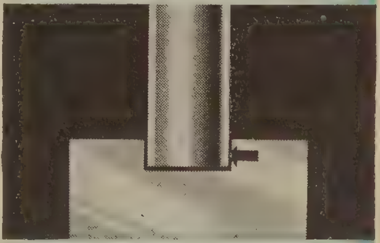
HOW THEY'RE MADE . . .



1. A slug of aluminum is struck one sharp blow in a die by a punch.



2. Because the die is larger than the punch, the metal *flows* out of the die and *shoots* up the punch.



3. The space between the die and punch determines wall thickness. The external design features are incorporated in the die, the internal in the punch.

This valve lifter for a heavy-duty diesel engine operates up to 900 strokes per minute and has to maintain a clearance of from 0.0025″ to 0.0035″. The best way to make it at lowest cost, with the fewest machining operations, is as an Alcoa Aluminum Impact Extrusion. The metal is Alcoa 14S Aluminum, with a typical tensile strength of 68,000 pounds.

Almost any part that is generally symmetrical can be impact-extruded. The dimensions are close and accurate . . . less finish machining is required.

Some intricate parts that could not be made by any other process are readily designed to be impact extrusions . . . you can let your design ideas take on new, moneysaving slants. Aluminum is light to reduce loads and inertia, strong to bear weight and impact.

Let us show you samples of parts that have been made as Alcoa Aluminum Impact Extrusions. ALUMINUM COMPANY OF AMERICA, 2185 Gulf Bldg., Pittsburgh 19, Pa. Sales offices in leading cities.

MORE PEOPLE WANT **MORE** ALUMINUM FOR **MORE** USES THAN EVER

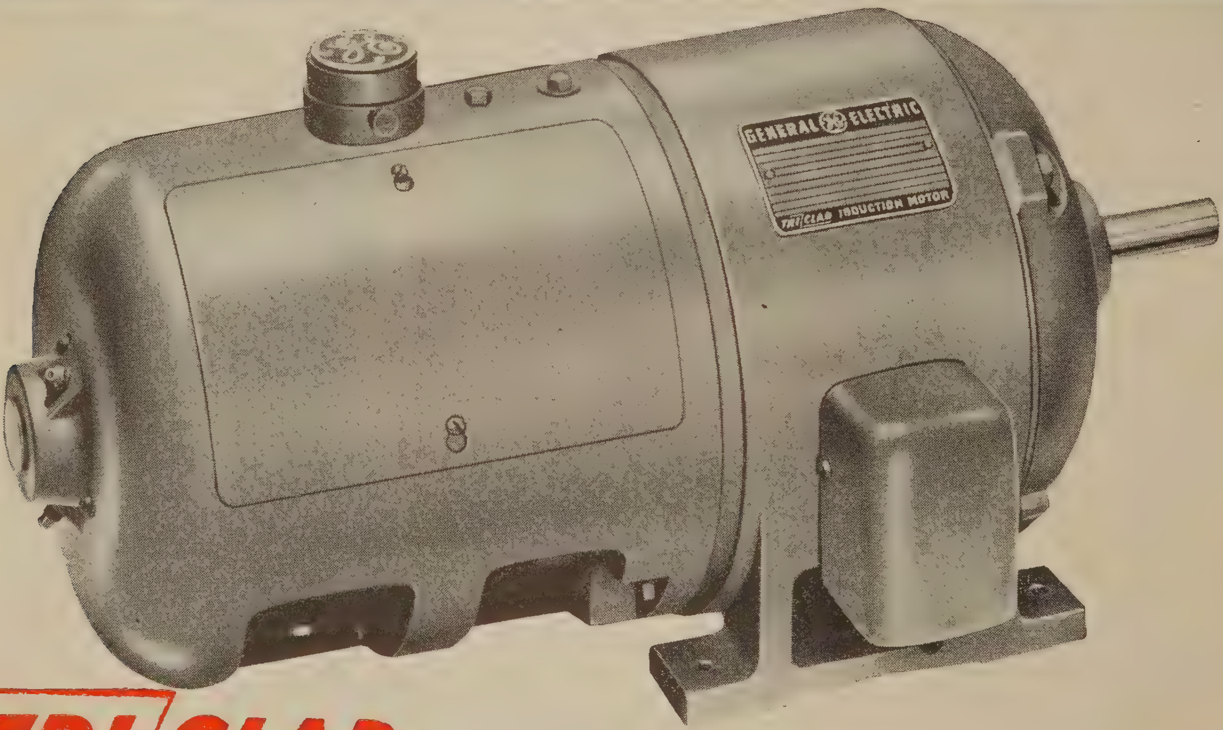
REG. T. M.

ALCOA FIRST IN ALUMINUM

IN EVERY COMMERCIAL FORM

now!

a simple a-c with 3 to 1 speed


GENERAL ELECTRIC
TRI-CLAD INDUCTION MOTOR

TRI/CLAD
REG. U.S. PAT. OFF.

Type ACA adjustable-speed induction motor

GENERAL ELECTRIC

750-292

motor range

HERE'S WHERE TO USE IT!

Textile

Slashers
Knitting machines
Individual finishing machines
Spinning frames
Printing machines

Chemical

Shakers
Grinders
Pulverizers
Mixers
Liquid pumps
Solids pumps

Metal-Working

Drawbenches
Lathes
Stamping presses
Milling machines
Grinders

Printing

Job presses
Coating machines
Trimming machines
Stitching machines
Rotary web presses

Food

Ovens
Proofers
Mixers
Fillers
Labelers
Grinders
Centrifugals
Conveyors
Shaker Screens
Pumps
Blanchers

Paper

Winders
Slitters
Supercalenders
Coating machines
Waxing machines
Embossers
Other converting machinery
Stock preparation machinery
Conveyors

Non-Ferrous & Rock Products

Mill feeder drives
Crusher feeder drives
Sinter conveyors
Other conveyors

Yes — you can now get a simple a-c motor and stepless speed adjustment over a 3 to 1 range *in a single, compact enclosure!* At the twist of a dial, the new Tri-Clad Type ACA induction motor changes speed quickly and accurately without *any power converting equipment.* Practically no different looking than any other induction motor, the Type ACA is a simple, economical way to equip old and new machines with an adjustable-speed drive and still retain the advantages of a-c motor operation.

Constant torque at any speed!

This new Tri-Clad motor provides constant torque over the entire 3 to 1 speed range and *holds* its speed despite load changes. Its efficiency and power factor are high at any speed — an important advantage where long operation over most of the speed range is customary. And for EXTRA PROTECTION against physical damage, electrical breakdown, and operating wear and tear, it features sturdy Tri-Clad design and construction.

Up to 50 hp available!

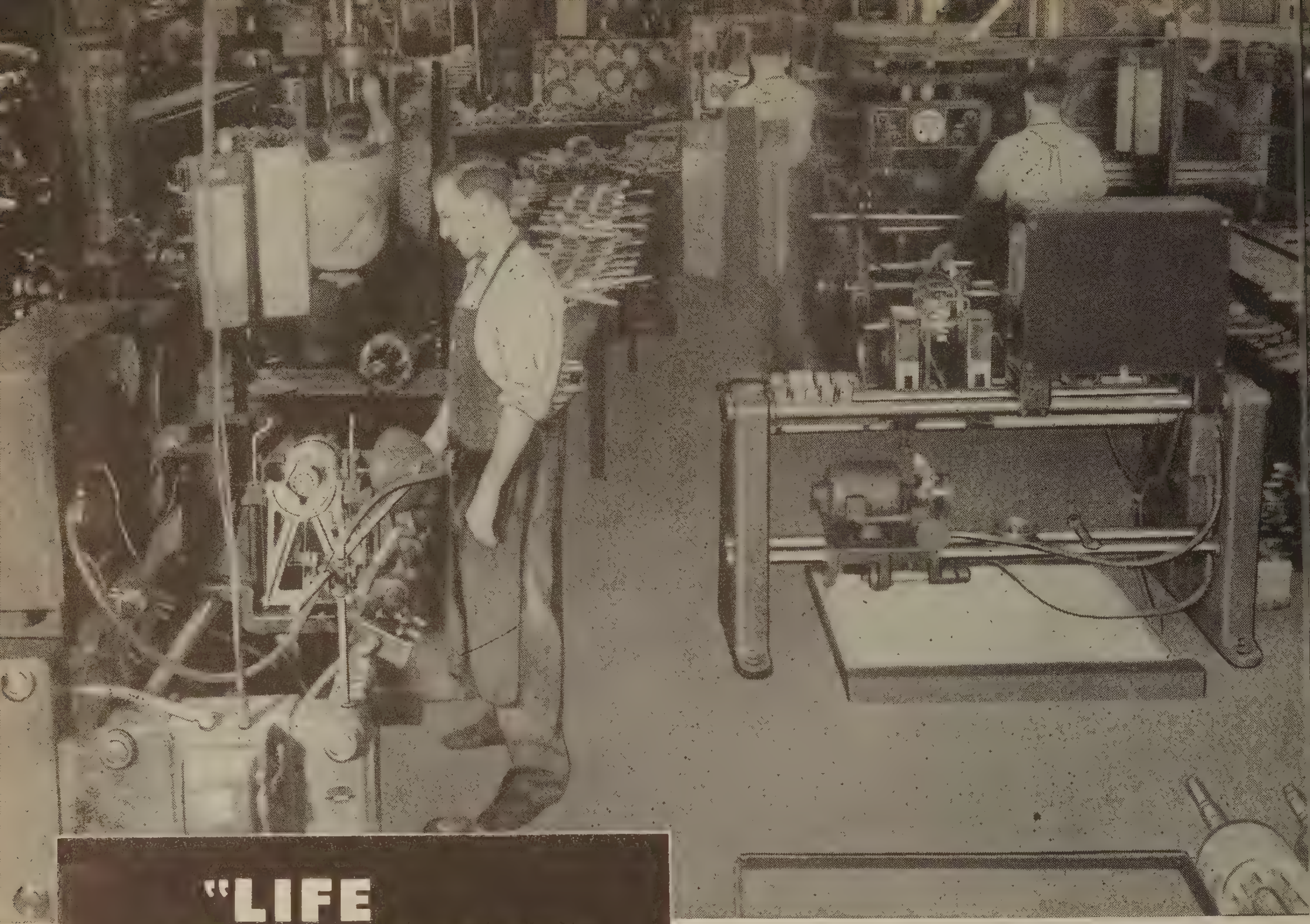
The Tri-Clad Type ACA induction motor with 3 to 1 speed adjustment is now available in ratings from 3 to 50 hp. Standard NEMA dimensions are used. For remote control, a flexible cable or pilot motor are available. Write today for Bulletin GEA-4883. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

GENERAL ELECTRIC COMPANY, Section 750-292
Apparatus Department, Schenectady 5, N. Y.

Please send me Bulletin GEA-4883 which describes the new Tri-Clad Type ACA motor:

NAME________________________________
COMPANY_____________________________
ADDRESS_____________________________
CITY__________________STATE__________

You can't beat Tri-Clad Extra Protection!



"LIFE INSURANCE" *for electric motors*

Gisholt DYNETRIC* Balancing Machines† increase the life expectancy of electric motors by eliminating the most common cause of failure—*vibration.*

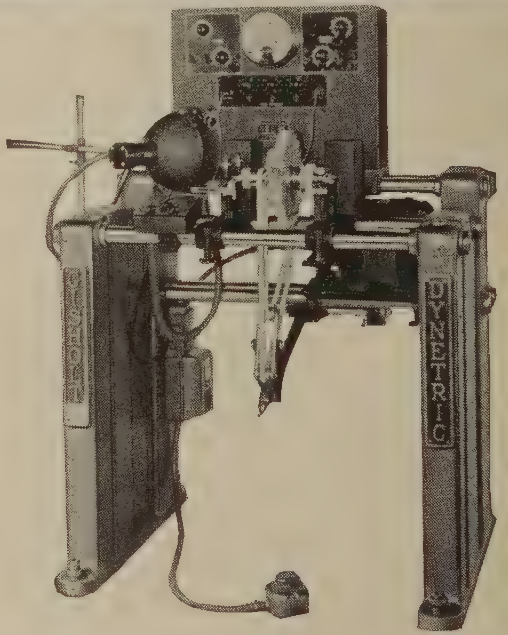
But they do more than that—they insure smoother, more efficient performance. No matter what the job may be, they do a better job. That's important—not only from the user's standpoint but from the manufacturer's as well.

Balancing Departments, like that pictured above, handle this work quickly and economically when they are equipped with Gisholt DYNETRIC Balancing Machines. They put balancing on a mass production basis. And they provide a degree of accuracy which cannot be equaled by any other means.

GISHOLT MACHINE COMPANY
Madison 3, Wisconsin

**DYNETRIC is a Trade-mark Reg. U. S. Pat. Off. by Westinghouse Electric Corporation.*

†Developed jointly with Westinghouse Electric Corporation.



GISHOLT DYNETRIC TYPE S BALANCER—*one of many sizes and types available to handle parts from a fraction of an ounce up to many tons. Locating and measuring unbalance requires but a matter of seconds. Where practical, correction equipment can be included as a part of the machine. Write for complete details.*

GISHOLT

TURRET LATHES • AUTOMATIC LATHES
SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface-finishing, and balancing of round and partly-round parts. Your problems are welcomed here.*

How far to the answer?

ONLY A MATTER OF FEET separates the Weirton specialists who bring their diverse talents to bear upon your steel problems. Metallurgists, production men, salesmen, shipping supervisors are all gathered within easy reach of one another "under one roof."

This centralization and coordination characterize all phases of Weirton's operations. And help to account for the unusual flexibility, versatility and speed of Weirton service.

The benefits of integrated operation extend to every steel that Weirton makes: Weirite hot-dip and electrolytic tin plate, Weirzin, Weircoloy, Weiralead, hot and cold rolled strip, cold rolled spring steel, cold rolled sheets, manufacturing and long ternes, structurals, N-A-X High-Tensile.

SHIPPING
PRODUCTION
QUALITY CONTROL
CUSTOMER CONTACT

WEIRTON STEEL COMPANY

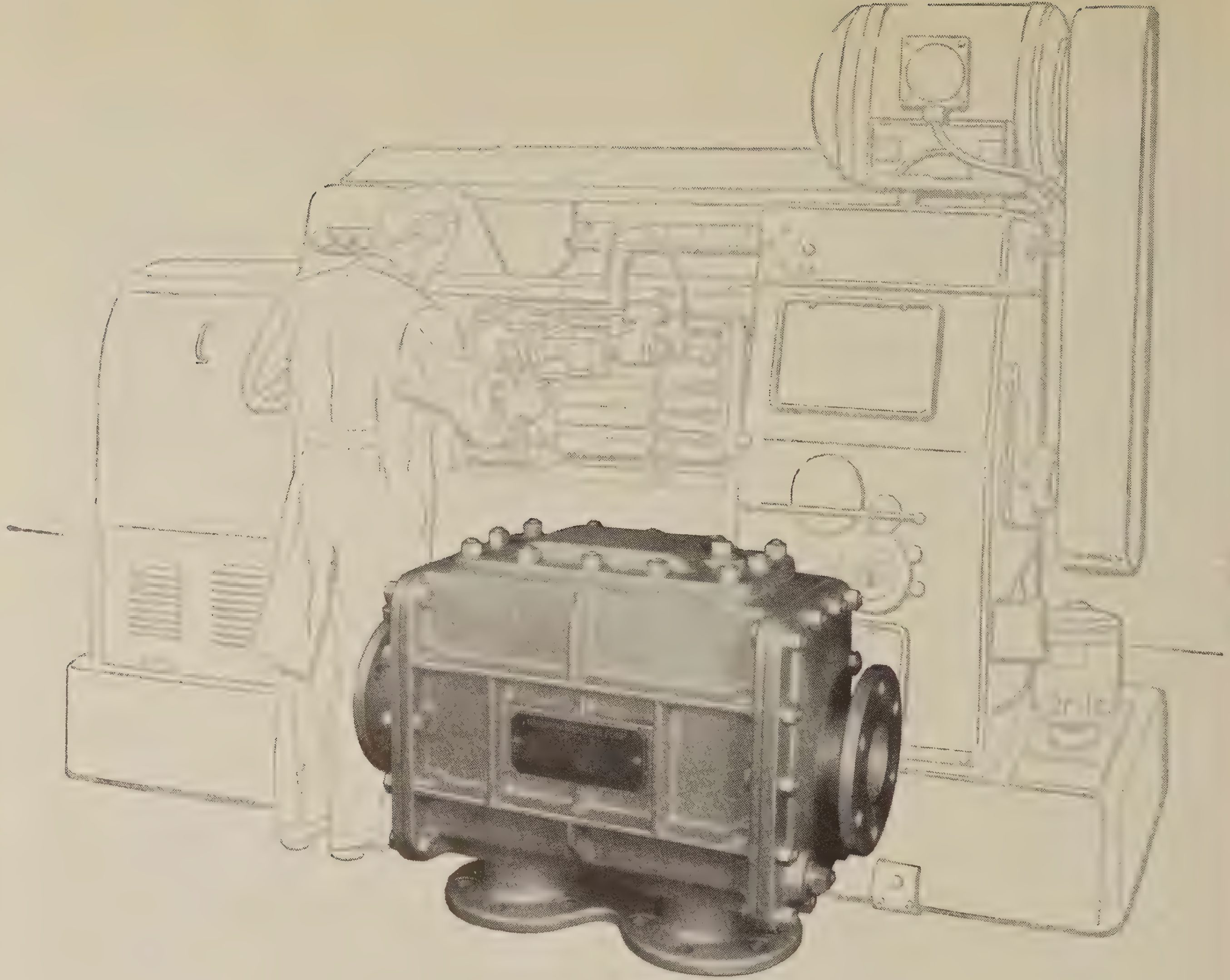
WEIRTON STEEL CO.

WEIRTON, W. VA. *Sales Offices in Principal Cities*

Division of **NATIONAL STEEL CORPORATION**

Executive Offices, Pittsburgh, Pa.

NATIONAL STEEL



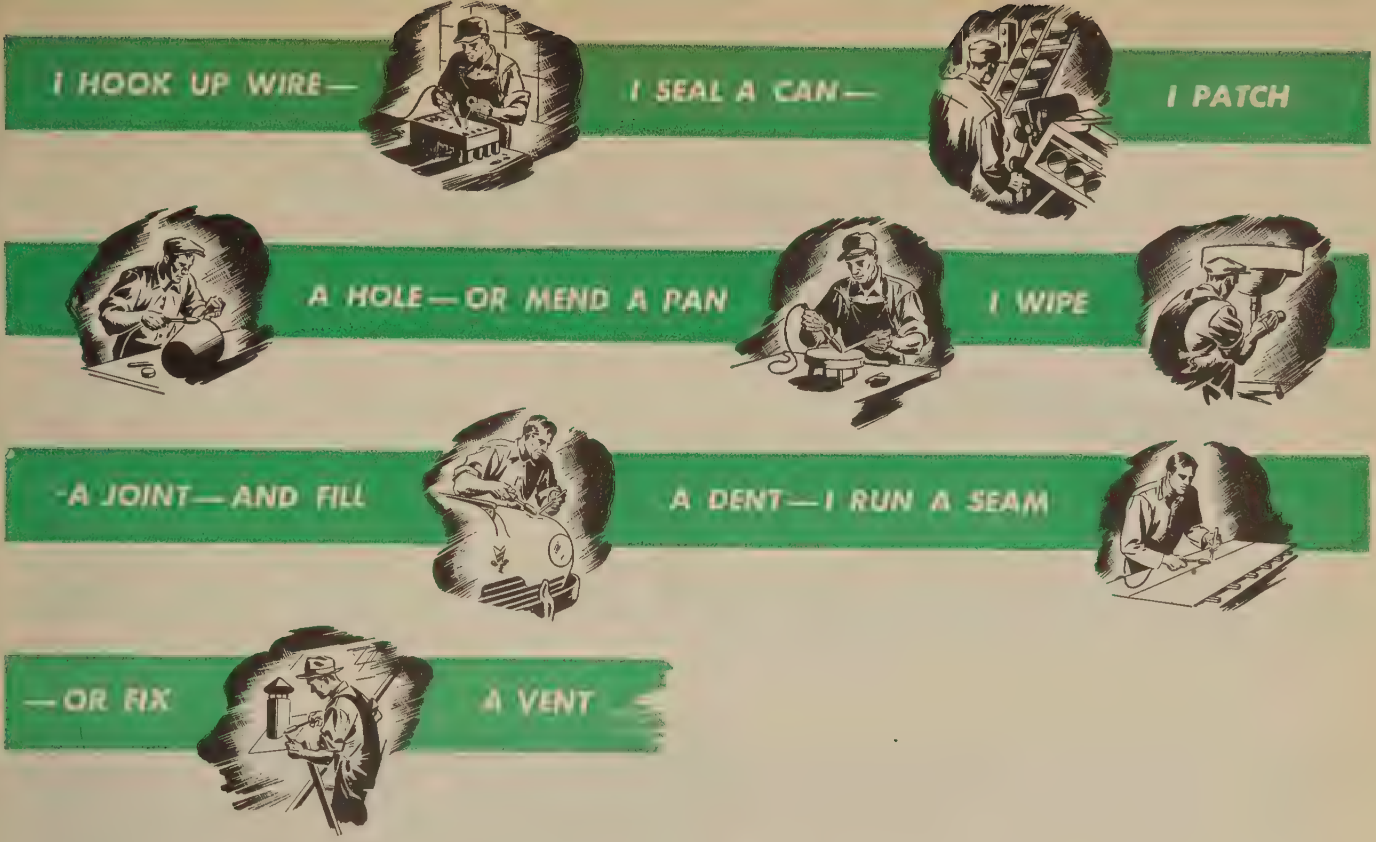
High Production Schedules Call For Harrison Oil Coolers

At no time is proper oil temperature more important than when machines are operating continuously. By keeping oil within the most effective temperature range, Harrison Oil Coolers minimize wear and reduce "down time" required for maintenance.

Harrison Oil Coolers are increasing production efficiency in a wide variety of industrial installations. Compact, sturdy and dependable, they are available in types and sizes to meet practically any requirement.

HARRISON

HARRISON RADIATOR DIVISION OF GENERAL MOTORS, LOCKPORT, NEW YORK



what am I ?

I'm a low-melting, free-flowing alloy that bonds quick as a wink. Know me? I come from a complete line of non-ferrous metals and alloys you can get easily anywhere in the United States. Know me now? I'm solder, of course. Federated solder.

And each Federated solder is but one of a tremendous family of "joiners". Federated solders are supplied in all commercial forms and compositions. Federated solders are made to fit the job—to provide low-melting, quick-freezing, a specific plastic range, or other required properties.

This complete line is your assurance that Federated can supply you with the exact solder in the form you need. And Federated's technical representatives are glad to help you solve industrial soldering problems. For information and prices, call or write *Federated Metals Division, American Smelting and Refining Company at 120 Broadway, New York 5, N.Y., or the office nearest you.*

Federated **METALS DIVISION**
AMERICAN SMELTING AND REFINING COMPANY

Federated
first in the
non ferrous
field
SMD

JMLCO F-615

THEY'RE NEW!

THREE NEW 20 KW RF GENERATORS

TO SPEED METALWORKING BY INDUCTION HEATING

A host of new operating features has been built into these new Westinghouse 20 kw r.f. generators . . . designed specifically to meet the demands of the metal-working industry.

These units have been designed specifically to meet the demands of the metalworking industry.

TYPE Ⓐ

Single-position unit with built-in worktable and transite table top . . . especially suited for brazing and soldering.

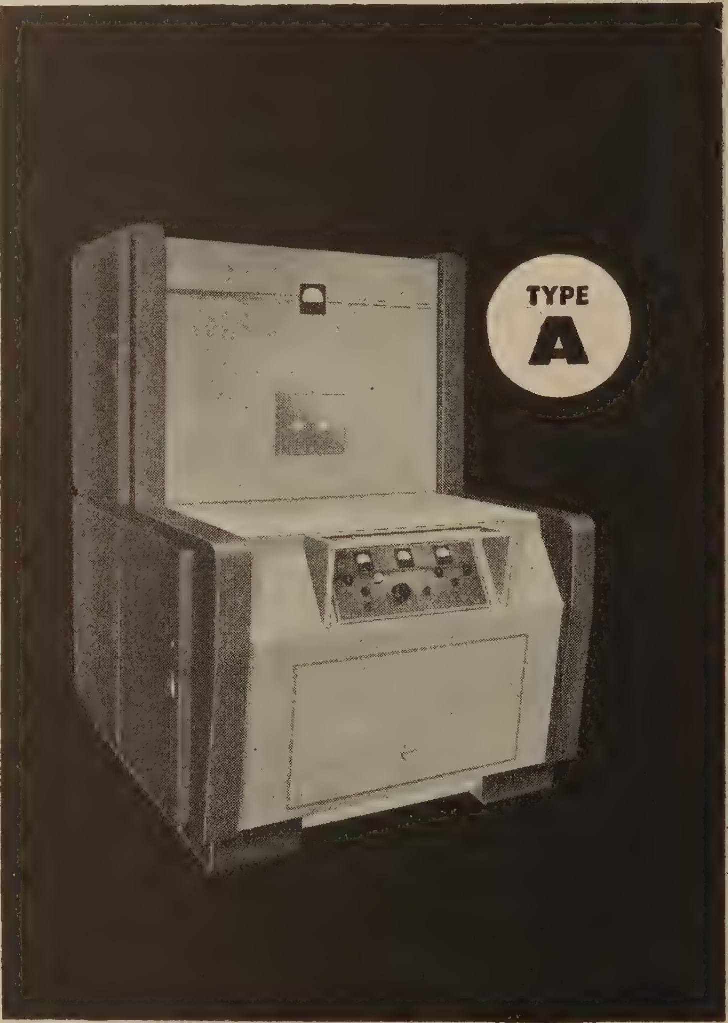
TYPE Ⓑ

Single-position unit with built-in work sink, two sets of water fittings and current transformer. Especially suited for hardening applications.

TYPE Ⓒ

Two-position unit with built-in work sink, two sets of coil and quench water fittings, two current transformers with automatic transfer switch to provide two independently controlled work positions. Ideally suited for all types of brazing, soldering, and hardening operations because its two work stations can be set up for the same or different operations, as required.

For further information on these—and other—Westinghouse r.f. heating equipment, from 2 to 200 kw, for either induction or dielectric heating applications, call your local Westinghouse office or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.



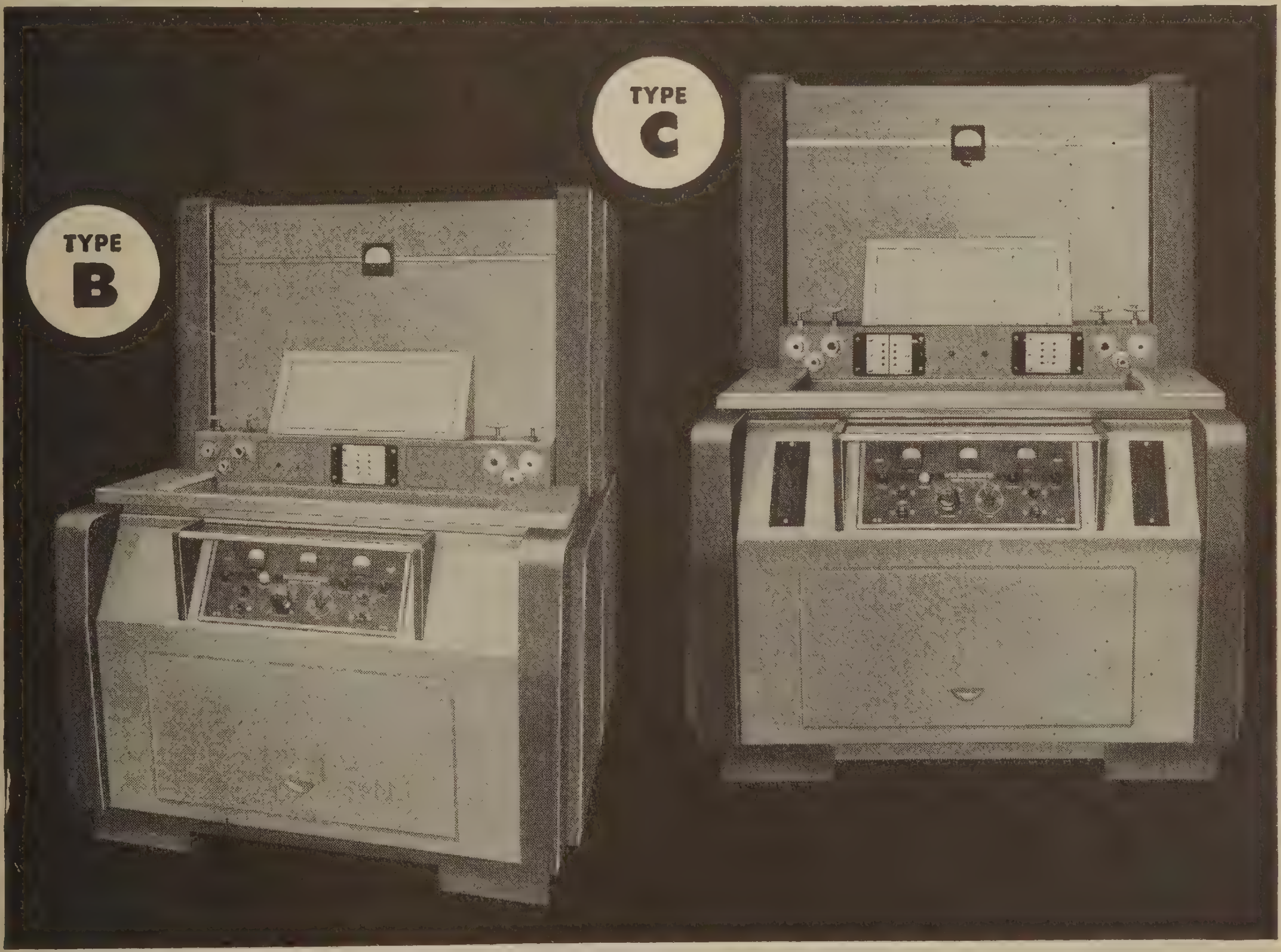
Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

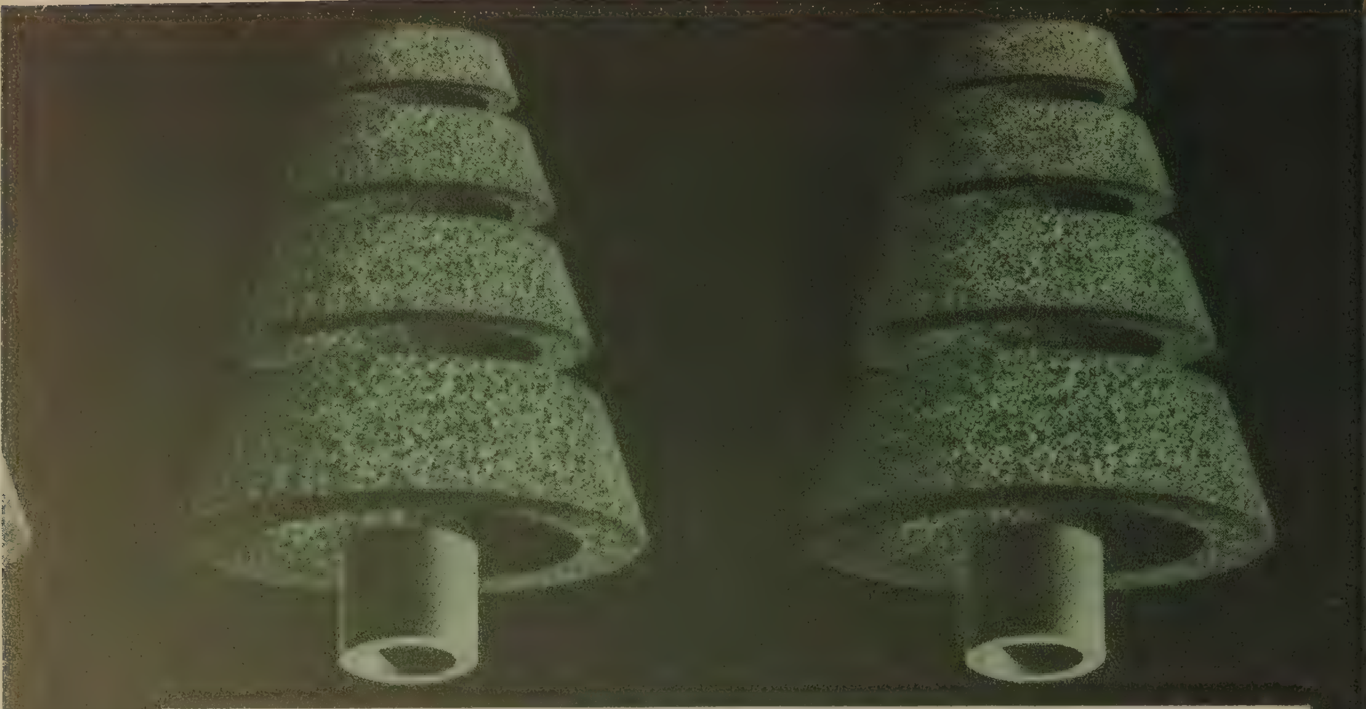
HERE ARE FIVE FEATURES THAT GIVE YOU OUTSTANDING OPERATING ADVANTAGES

1. A completely self-contained unit . . . worktable or sink, current transformers and water fittings are all completely assembled into the generator housing making it easy to install, simple to operate, and conserving floor space. Gone are the days of buying and installing r.f. generators, worktables and accessories separately.
2. Rugged construction . . . structurally formed, heavy-gauge aluminum cabinet provides unexcelled shielding from r.f. radiation. Six large, full-opening doors with individual locks allow ready access to all components by authorized personnel only.
3. Stepless electronic power output control from 0 to 20 kw provides unusual operating flexibility and insures uniform performance on repetitive setups.
4. Easily adaptable to a wide variety of work handling setups because:
   a. The sturdy, 12″ deep, stainless steel sink is equipped with 8 tapped bosses for mounting work handling equipment.
   b. Built-in, plug-type outlets at each work position provide 230-volt power for work handling equipment motors and for hand or foot control of both quench and heat to provide easy setup or continued operation.
   c. Heavy-duty, tapped, r.f. output terminal blocks insure rigid mounting for the work coils.
   d. Space is available below the sink for work handling mechanisms of unusual space requirements.
5. The pushbuttons and other controls are located, for ease in operation, at waist-high level.

J-02106



Electronics at Work



How to say "Merry Christmas" in grinding wheel language

Present your management with year-'round savings in your grinding wheel usage.

Such savings would be welcomed by any management—and here's how to do it:

Call in Peninsular Engineers for a study of your grinding. They will analyze your grinding operation completely—your machines, your wheels and the metals you grind.

After this analysis, they will show you how to get greatest results for lowest cost, a Peninsular specialty since 1889. This service costs you nothing, but may save you a lot. You can't afford to overlook it!

The Peninsular Grinding Wheel Co., 729 Meldrum Ave., Detroit 7. *Sales Offices:* Chicago, Philadelphia, Boston, Buffalo, Cleveland, Pittsburgh, Houston, St. Louis, Cincinnati.

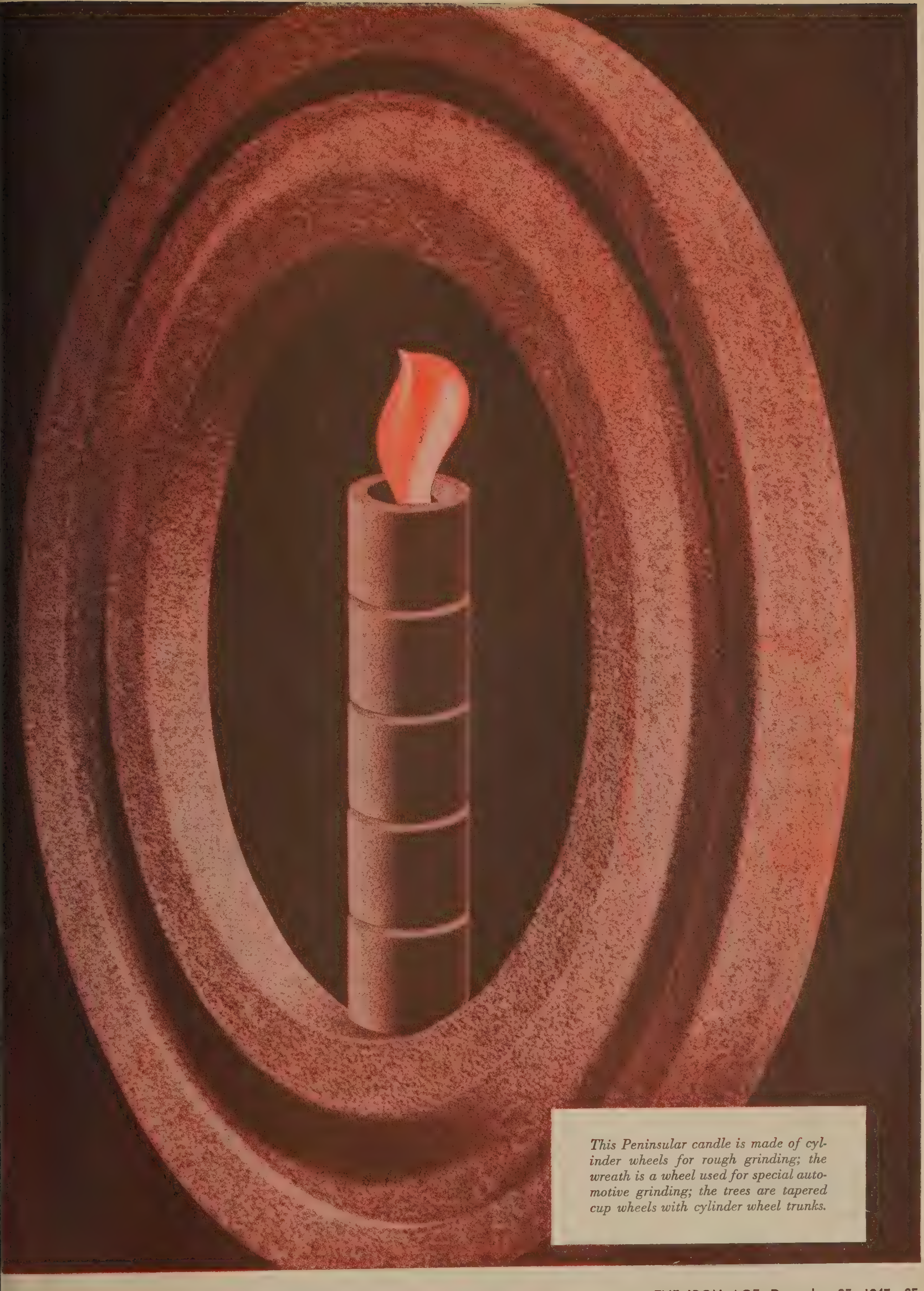
PENINSULAR

INDIVIDUALLY PENINSULAR *ENGINEERED*

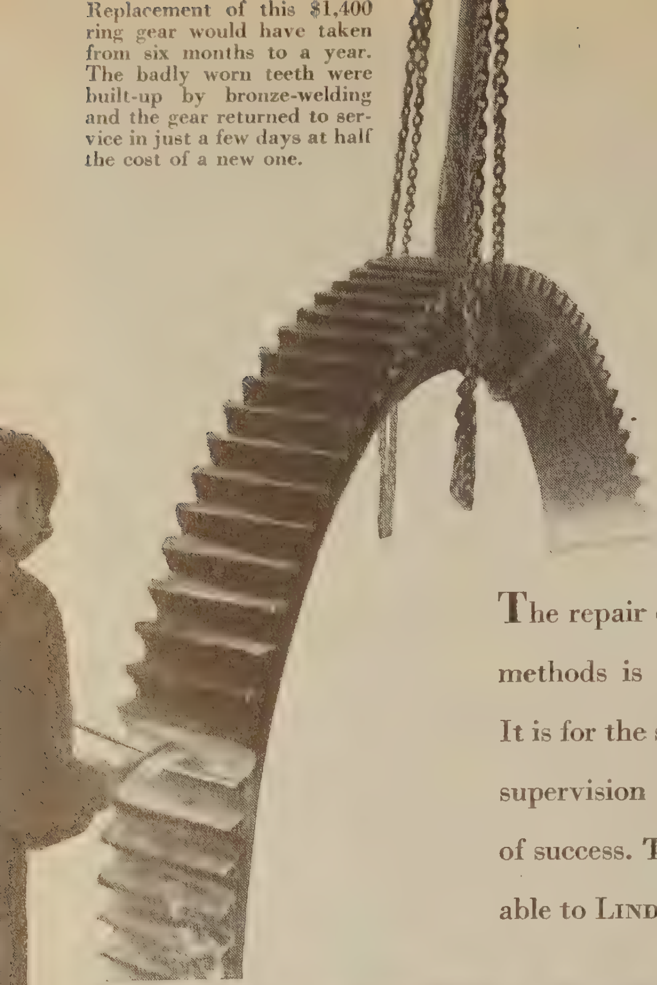
GRINDING WHEELS

SINCE 1889

SPECIALISTS IN RESINOID BONDED WHEELS



This Peninsular candle is made of cylinder wheels for rough grinding; the wreath is a wheel used for special automotive grinding; the trees are tapered cup wheels with cylinder wheel trunks.



Replacement of this $1,400 ring gear would have taken from six months to a year. The badly worn teeth were built-up by bronze-welding and the gear returned to service in just a few days at half the cost of a new one.

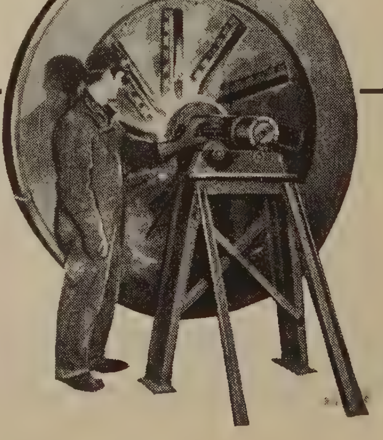
Keeping the "wheels" going 'round

The repair of vast quantities of equipment by oxy-acetylene methods is of course routine for plant maintenance crews. It is for the special job, however, that the LINDE serviceman's supervision and work proves so valuable and gives assurance of success. This skilled, specialized assistance is always available to LINDE customers. Just phone the nearest LINDE office.

Bronze-welding this cast steel cone crusher head saved $1,000. The crack, which ran completely around the head for a distance of 9½ ft., extended through the thickness of the casting in several places. It was veed out by flame-gouging.

This cast iron steam hammer cylinder weighs 4,000 lb. Two large cracks, one on each side of the cylinder wall, were bronze-welded in only 14 hours. A new casting would have taken 16 weeks to obtain and would have cost more than 10 times as much.

Flanges are quickly joined to cast iron pipe sections by bronze-welding. LINDE supplies several bronze rods to meet varying service requirements.



Bronze-welding effected a considerable saving of cost and time when four spokes of this huge cast iron pulp-chipper wheel was cracked at the hub.

The word "Linde" is a registered trade-mark of The Linde Air Products Company.

Linde

THE LINDE AIR PRODUCTS COMPANY
Unit of Union Carbide and Carbon Corporation
30 East 42nd St., New York 17, N. Y. UCC Offices in Other Principal Cities
In Canada: DOMINION OXYGEN COMPANY, LIMITED, Toronto

your doorway to greater STEEL SERVICE

If You Are a Steel Producer:

Behind this door is an organization qualified by experience to give steel producers a sound distributing service. This type of service is especially valuable for now and the future because Calumet is located in a heavily industrialized area that is ever-expanding.

If You Are a Steel User:

You can walk through this doorway and discuss your problems with the specialists in steel who comprise our staff . . . inspect our yard and shops, complete with every modern facility for handling and fabricating steel. Then you'd quickly understand why Calumet is in a position to render a dependable, greater steel service.

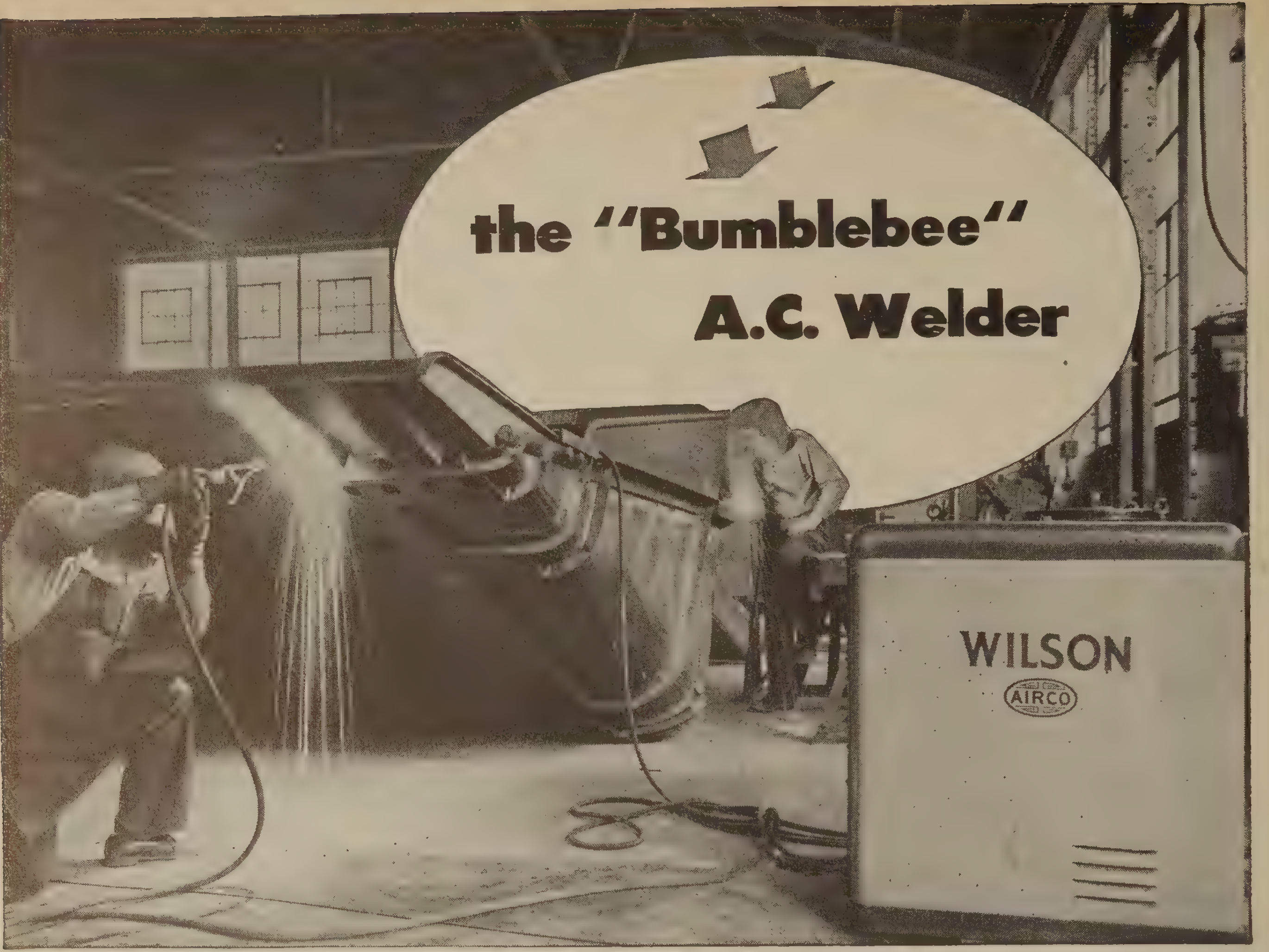
We'd welcome your visit . . . or if you wish, write us on your steel needs and problems—without obligation. In any case you'll find it pays to call Calumet.

CALUMET IRON & SUPPLY CO.

CALISCO
SINCE 1926

EAST CHICAGO, INDIANA • Cable Address: CALISCO

structural steel • plates • pipe-tubing • steel erectors and dismantlers • steel fabrication • railroad materials



GIVES YOU All These Important Operating Features

① **WIDE CURRENT RANGE** from 30 to 275 amperes for the 200 ampere model; 60 to 375 amperes for the 300 ampere machine; and 100 to 625 amperes for the 500 ampere type.

② **IMPROVED ELECTRICAL EFFICIENCY** at rated load of 84½%, 81% and 83%, respectively for the 200, 300 and 500 ampere sizes is provided.

③ **LOW OPEN CIRCUIT VOLTAGE** (75 volt) works to greater advantage on new AC electrodes and gives perfect ease of welding.

④ **VASTLY IMPROVED POWER FACTOR** virtually eliminates the penalty charge of low power factor, and permits the use of smaller primary cables, line switches and fuses. This feature also permits the operation of more welders from existing feeders without causing overload.

⑤ **QUIET OPERATION** because there are no rotating parts in the circuit design. The Wilson "Bumblebee" is almost silent in operation.

⑥ **MINIMUM MAINTENANCE** because its operation involves no moving parts with the exception of the fan.

These plus values inherent in the advanced design of Wilson "Bumblebee" arc welders make possible *better quality welding with a reduction in power consumption.*

AIRCO AIR REDUCTION

Offices in All Principal Cities

Headquarters for Oxygen, Acetylene and other Gases . . . Carbide . . . Gas Welding and Cutting Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories

For more information about the complete line of Wilson "Bumblebee" A. C. welders, fill in the coupon below. Send it to: Air Reduction, General Offices, 60 East 42nd Street, New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, General Offices, Houston 1, Texas. Represented Internationally by Airco Export Corporation.

AIR REDUCTION IA
60 East 42nd Street
New York 17, N Y.

Send me copy of your catalog ADW-53.

Firm____________________

Signed by____________________

Address____________________

City__________ Zone____ State______

From Little Acorns . . . .

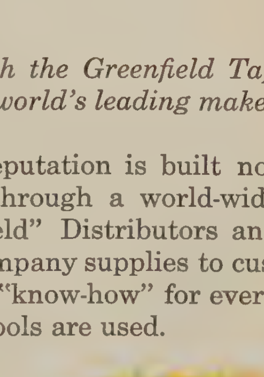
The industrial history of this country is made up of "success stories" in the American tradition —of small businesses which, through the years, have flourished and expanded and become world famous.

Common to all these has been the foresight and the will of the founders to pioneer and the determination of succeeding generations to make their particular product the best in the world. *So it has been with the Greenfield Tap and Die Corporation, the world's leading maker of taps and dies today.*

But "Greenfield's" reputation is built not alone on its products. Through a world-wide organization of "Greenfield" Distributors and "Greenfield Men", this company supplies to customers the tools and the "know-how" for every job, wherever threading tools are used.

GTD
Greenfield
75th YEAR

The "Greenfield" Distributor brings our shipping room into your backyard, providing you with quick, expert service at all times. When you want threading tools or gages, no need to write a letter . . . just pick up your phone and call the "Greenfield" Distributor.



GREENFIELD TAP and DIE CORPORATION
Greenfield · Massachusetts

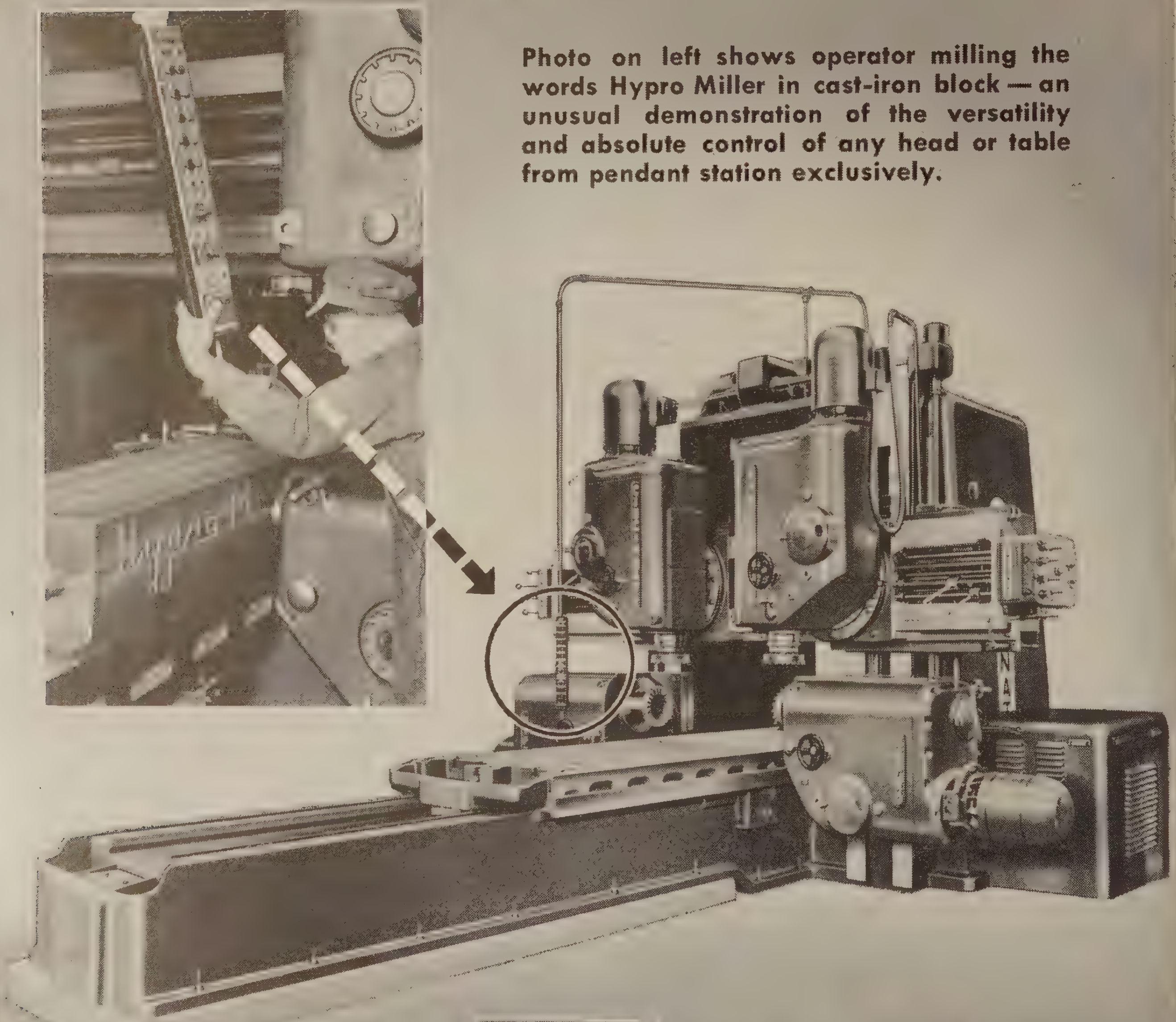
The GEOMETRIC TOOL COMPANY
New Haven, Connecticut · In Its Fifty-Fourth Year
A DIVISION OF GREENFIELD TAP and DIE CORPORATION

NOW COMPLETE FINGER-TIP CONTROL FROM PENDANT STATION...

Hypro·*electronic*

PLANER MILLER DRIVE

Photo on left shows operator milling the words Hypro Miller in cast-iron block — an unusual demonstration of the versatility and absolute control of any head or table from pendant station exclusively.



THE CINCINNATI HYPRO PLANER COMPANY

PLANERS · BORING MILLS · PLANER TYPE MILLERS

CINCINNATI, OHIO

Haskelite Materials

OPEN NEW HORIZONS IN PRODUCT DESIGN

Designers and manufacturers find the unique characteristics of Haskelite Structural Materials offer many advantages over wood, metal or other materials they are replacing in so many products . . . and find they help build products that look better, perform better and sell faster.

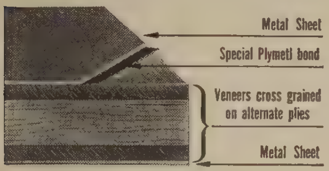
SALES BUILDING APPEARANCE: In the group of Haskelite Materials, are lightweight metal faced plywoods with smooth, ripple-free surfaces . . . metal backed veneers of beautiful woods that may be fabricated as easily as sheet metal . . . any one will help add new eye appeal to your products.

LIGHT WEIGHT—GREAT STRENGTH: The *rigid strength-to-weight* ratios of certain Haskelite Materials are unmatched by even the newest of light alloys.

SIMPLIFIED CONSTRUCTION: Haskelite materials are worked with simple tools. Their use often eliminates numerous or complicated framing members — cutting deadweight and saving time. Write for bulletin SC-47.

Plymetl *

A lightweight, high quality plywood plaque with light gauge metal sheets permanently bonded to one or both sides. This material has a high *rigid strength-to-weight* ratio, is sound deadening, fire retardant, and high in insulating value. Its flat, smooth metal surfaces take and retain a beautiful finish, free from distorting highlights.

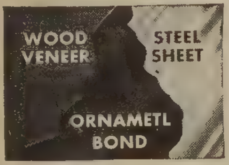


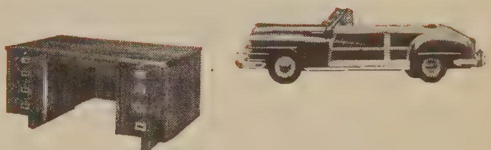
TYPICAL USES

Escalator side panels, interior finish for railway passenger cars. Truck and trailer body panels. Table tops, restaurant counter tops, etc.

Ornametl *

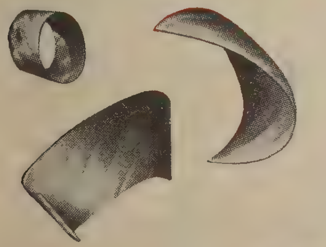
A thin veneer of choice wood is bonded to thin gauge sheet steel. Ornametl is readily adaptable to production methods and equipment used for fabricating sheet metal. It may be stamped, pressed, or rolled to shape. It can be sawed, drilled, punched, and fastened by welding, nailing, or with metal screws or rivets.





Office furniture, station wagon side panels, interior finish for passenger cars, house trailers, home or office interiors, and appliances, clocks, magazine racks, decorative ornaments, etc.

Plymold



This process permits molding to either simple or compound curvatures, depending upon the material. Fine plywood and other composite materials such as Haskelite Plymetl and Plastiply have been molded by this process in volume quantity.

*T. M. Reg.

Motor or sailboat hulls, radio and television cabinets, home or office furniture, aircraft fuselage, wing and tail assemblies, etc., in volume quantities.

HASKELITE T.M. Reg.

structural materials for men who build better

HASKELITE MANUFACTURING CORP. **DEPT. IA** **GRAND RAPIDS 2, MICHIGAN**

New York Chicago Detroit Philadelphia Cleveland Los Angeles St. Louis

Canada: Railway & Power Engineering Corp., Ltd.

AIR C
VEGETABLES

FOR LASTING PAINT ADHERENCE

on a zinc-coated steel sheet

. . . you can't beat Republic Electro Paintlok

It's the difficult paint-on-sheet-metal jobs that demonstrate the paint adherence of Republic ELECTRO PAINTLOK to best advantage. This "air-conditioned" vegetable stand is a good example. The painted steel frames which hold the vegetables—and which must resist rough use and moisture—are ELECTRO PAINTLOK.

This chemically-treated, zinc-coated sheet takes and *HOLDS* paint, lacquer and enamel without expensive pre-paint cleaning and preparation, because it was developed specifically for this use. It comes to you clean and in prime condition for painting—and it does not rust in storage.

Another important advantage is the tightness of the zinc coating. It will take as much fabrication strain as the base metal can stand—without cracking, peeling, flaking or powdering. And it protects against underfilm corrosion if the paint film is damaged in service.

Right now, Republic ELECTRO ZINC PLATED SHEETS are helping to improve quality and to cut costs for practically all types of painted sheet steel items. Write us, and we'll be glad to talk about your product.

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, New York

Republic Electro Zinc Plated Products include ELECTRO PAINTLOK and ELECTRO ZINCBOND in sheets and coiled strip, in various widths depending on gauge involved.

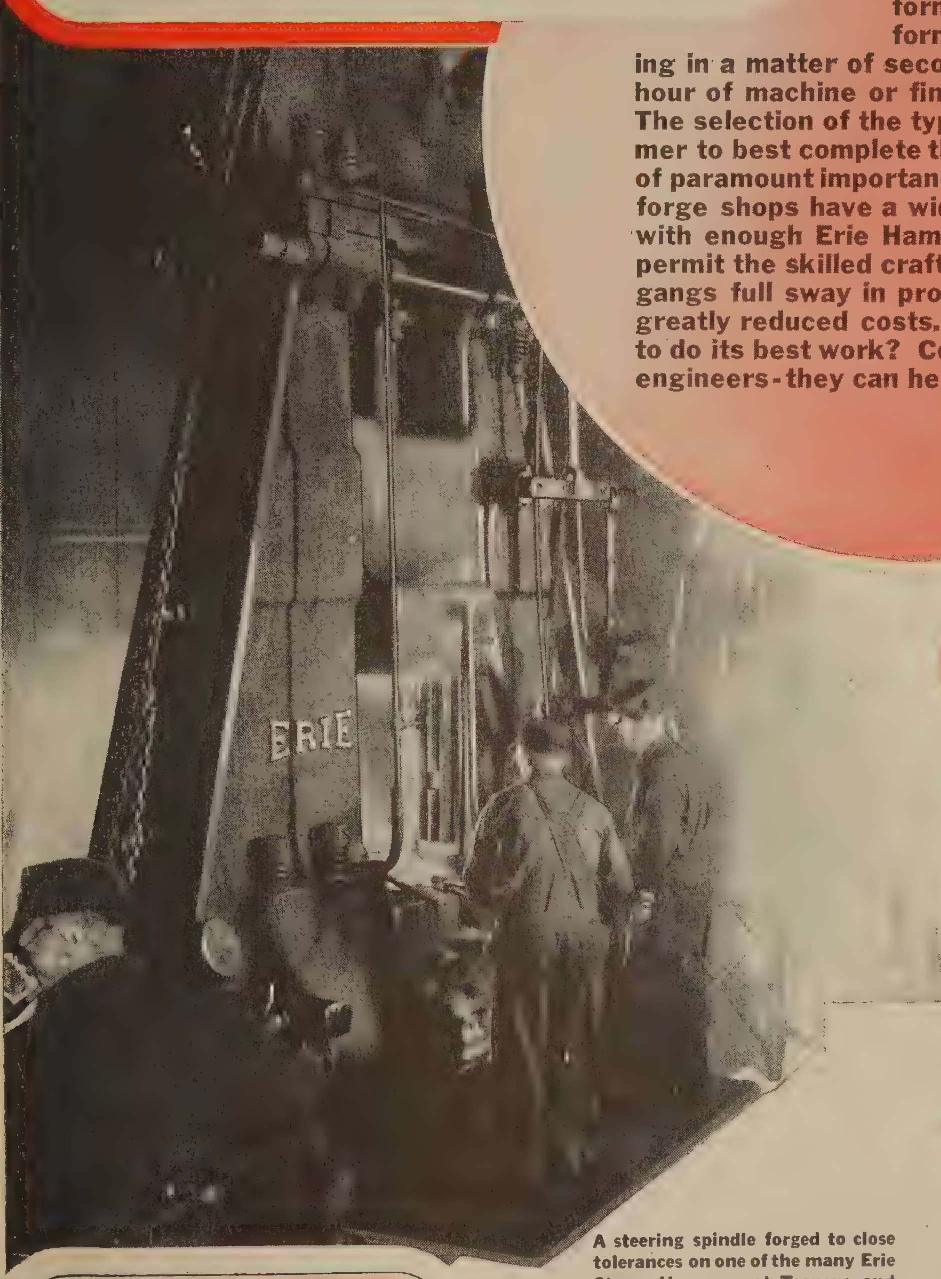
REPUBLIC STEEL
REG. U. S. PAT. OFF.

Republic
ELECTRO ZINC PLATED SHEETS
Electro Paintlok • Electro Zincbond
REG. U. S. PAT. OFF.

Other Republic Products include Carbon, Alloy and Stainless Steels—Sheets, Strip, Plates, Bars, Pipe, Tubing, Bolts and Nuts, Wire

Where 60 Seconds May Gain 1 Hour ~

ERIE STEAM HAMMERS in the modern forge shop, matched by the skill of the hammergang, achieve uniformity of size and shape in forming the average forging in a matter of seconds . . . as much as an hour of machine or finish time is thus saved. The selection of the type and size of Erie Hammer to best complete the forging job in hand is of paramount importance. Many Erie-equipped forge shops have a wide variety of capacities with enough Erie Hammers on instant call to permit the skilled craftsmen in these hammergangs full sway in producing finest quality at greatly reduced costs. Is your shop equipped to do its best work? Consult with Erie Foundry engineers - they can help you.



A steering spindle forged to close tolerances on one of the many Erie Steam Hammers at Transue and Williams Steel Forging Corporation, Alliance, Ohio.

ERIE

ERIE FOUNDRY COMPANY, ERIE, PA.

ERIE BUILDS *Dependable* HAMMERS

It's the SIDES OF A V-BELT That Really GET the WEAR!

-- ONLY the SIDES Touch the pulley!

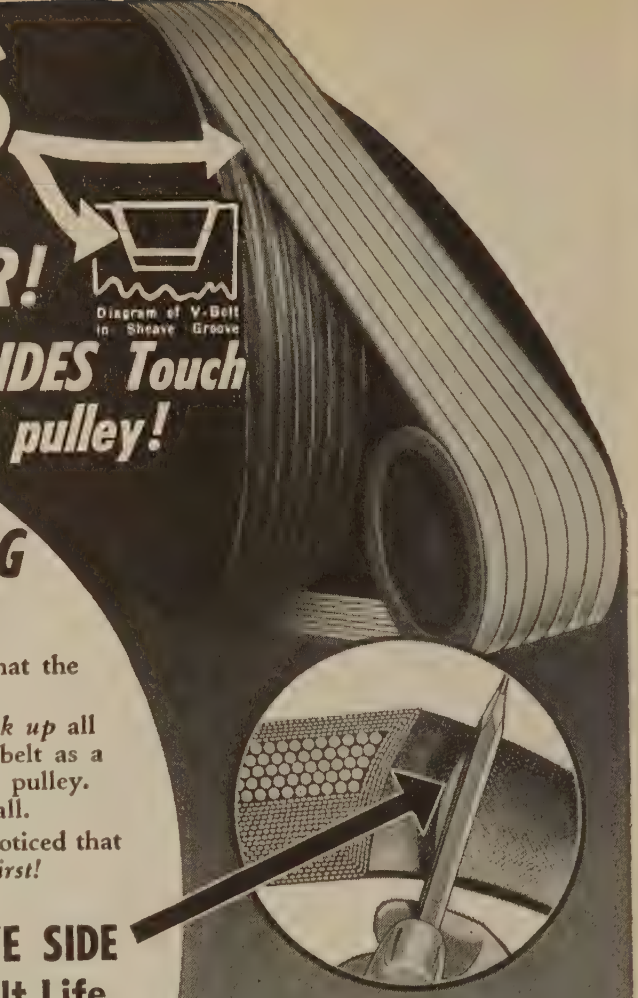


Diagram of V-Belt in Sheave Groove

The SIDES Do ALL the GRIPPING —They Pick Up ALL the LOAD!

The moment you think about it, you realize, of course, that the *sidewall* is the part of a V-Belt that really gets the wear.

It's the *sidewall* that has to grip the pulley. It has to *pick up* all the power from the driver pulley, transmit that power to the belt as a whole and then, once more, deliver the power to the driven pulley. And the sidewall takes all the wear against the sheave-groove wall.

That is the perfectly natural reason why you have always noticed that the sidewall of the *ordinary* V-Belt is the part that *wears out first!*

Now See How the Patented CONCAVE SIDE SAVES Sidewall Wear—Lengthens Belt Life.

Since the sidewall is the part that wears out first, anything that prolongs the life of the sidewall will lengthen the life of the belt.

The simple diagrams on the right show exactly why the ordinary, straight-sided V-Belt gets excessive wear along the middle of the sides. They show also why the Patented Concave Side greatly reduces sidewall wear in Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight-sided V-Belt can possibly give.

—and the Concave Side is *MORE IMPORTANT NOW* Than Ever Before!

Now that Gates *SPECIALIZED* Research has resulted in Super Vulco Ropes capable of carrying much heavier loads —up to 40% *higher horsepower ratings* in some cases— the sidewall of the belt is called upon to do even more work in transmitting these heavier loads to the pulley. Naturally, with heavier loading on the sidewall, the life-prolonging Concave Side is more important NOW than ever before!

The CONCAVE SIDE is a GATES PATENT

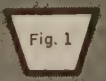


Fig. 1

Straight Sided V-Belt

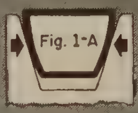


Fig. 1-A

How Straight Sided V-Belt Bulges When Bending Around Its Pulley

You can actually feel the bulging of a straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.

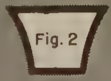


Fig. 2

Gates V-Belt with Patented Concave Sidewall

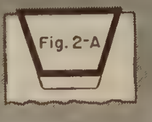


Fig. 2-A

Showing How Concave Side of Gates V-Belt Straightens to Make Perfect Fit in Sheave Groove When Belt Is Bending Over Pulley.

No bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall —and that means much longer life for the belt"

4712

THE GATES RUBBER COMPANY DENVER, U. S. A., *"World's Largest Makers of V-Belts"*

GATES VULCO ROPE DRIVES

Engineering Offices and Jobber Stocks **IN ALL INDUSTRIAL CENTERS** of the U. S. and 71 Foreign Countries

Gates

THE MARK OF SPECIALIZED RESEARCH

WHAT HAVE ALUMINUM TRUCK BODIES GOT TO DO WITH MY PROBLEM?

JUST THIS. They proved that a change to aluminum from other materials so improved product performance that the consumer thinks of this lightweight metal in terms of savings rather than cost.

"Too costly", said truck body builders before the war. But today they find that with aluminum at an all-time low and its light weight offering 3 times the working area of steel on a pound for pound basis that it is practically a "must" metal. And these "pay-off" advantages appeal to the consumer—greater pay loads, lower fuel costs, increased tire mileage, freedom from rot and rust and even lower license fees.

Remember, too, aluminum's light weight favors the manufacturer as well as the consumer. Pound for pound, aluminum gives three times the working area of steel, brass or copper. It is easier to handle on the production and assembly lines; often eliminates one or more finishing operations and costs less to ship. In other words, add up *all* the savings and you are likely to find that you can offer the advantages of aluminum at the same cost or less.

Yes, there are many factors that go to make up the true cost of aluminum. Failure to consider them all may be costing you the benefits of this modern metal. Reynolds technicians will welcome the opportunity to work with you in the use of aluminum for the betterment of your products and profits. For complete information contact your local Reynolds Sales Office or write Reynolds Metals Company, 2526 South Third Street, Louisville 1, Kentucky.

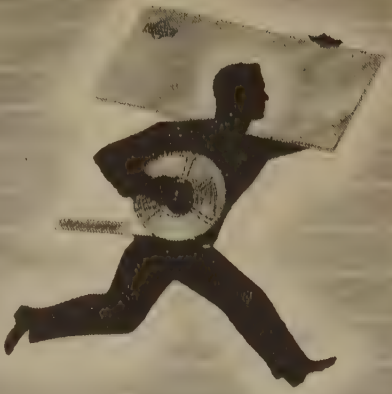
The price of aluminum has been reduced 30% since Reynolds became a primary producer in 1939.

REYNOLDS METALS

REYNOLDS
THE GREAT NEW SOURCE OF ALUMINUM

INGOT • SHEET • SHAPES • WIRE • ROD • BAR • TUBING • PARTS • FORGINGS • FOIL • POWDER

It's Gotta Fit...



DEPENDABLE DAN
Our Customers' Man

IT MUST FIT YOUR JOB

RELIANCE

JOB-FITTED STEEL

Best fitted to do a specific job for a specific customer at a specific time — and all factors considered, at lowest cost.

RELIANCE STEEL DIVISION

Detroit Steel Corporation

GENERAL OFFICES: 1025 SOUTH OAKWOOD AVE., DETROIT 9, MICH.
PLANTS: CHICAGO*, CLEVELAND*, DETROIT*, LYNDHURST, N. J., WORCESTER, MASS.
SALES OFFICES: GRAND RAPIDS,* INDIANAPOLIS*, NEW HAVEN, PHILADELPHIA*, ST. LOUIS, TOLEDO*
ALUMINUM SHEETS and STRIP—available through locations marked

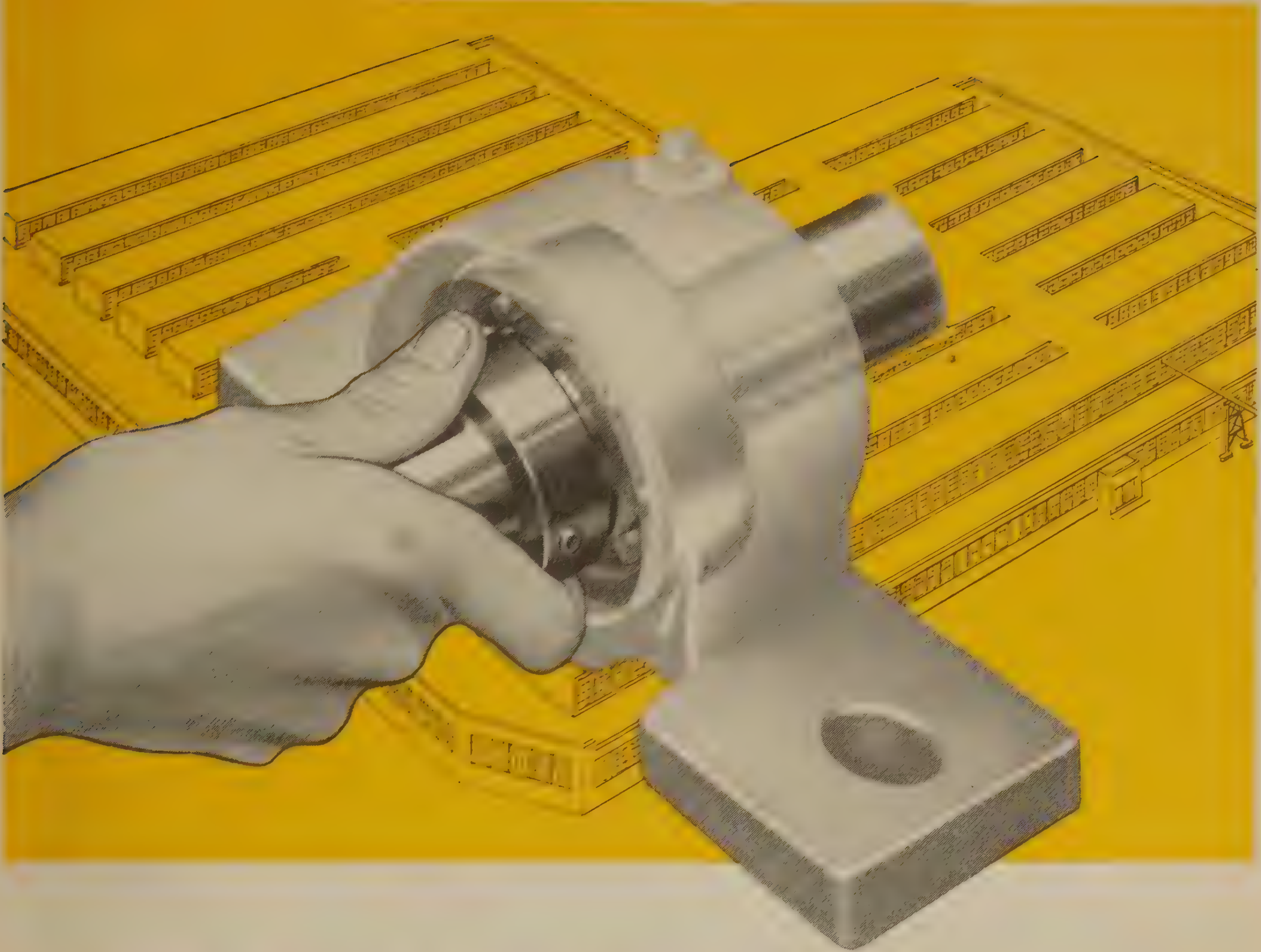
PRODUCTS

SHEETS
- Hot Rolled
- Hot Rolled Pickled
- Cold Rolled
- Long Terne
- Galvanized

PLATES

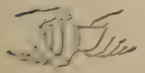
COLD ROLLED STRIP STEEL
- Coils and Cut Lengths, Slit or Round Edge
- All Tempers

ALUMINUM* Sheets and Strip

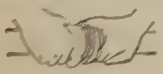


How to build a 100,000 sq. ft. manufacturing business with a "twist of the wrist" • • •

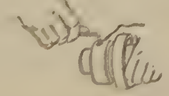
Nothing could be simpler. You watch a mechanic coaxing a ball bearing onto a shaft, holding up production while he sweats out a snug fit and fusses with lock nuts or adapters. And you say to yourself, "Now, if that inner ring were extended and an eccentric cam machined on the end that matched a cam on a slip-over collar, then you could lock the bearing on the shaft with a twist of the wrist . . . and unlock it the same way." Anybody can see you have something there, so it won't be long before it's going to take a big factory to supply the demand for these self-locking ball bearings.



BEARING SLIP-FITS ON SHAFT.



A TWIST OF THE WRIST ENGAGES CAMS ON INNER RING AND COLLAR



SET SCREW PROVIDES DOUBLE LOCK.

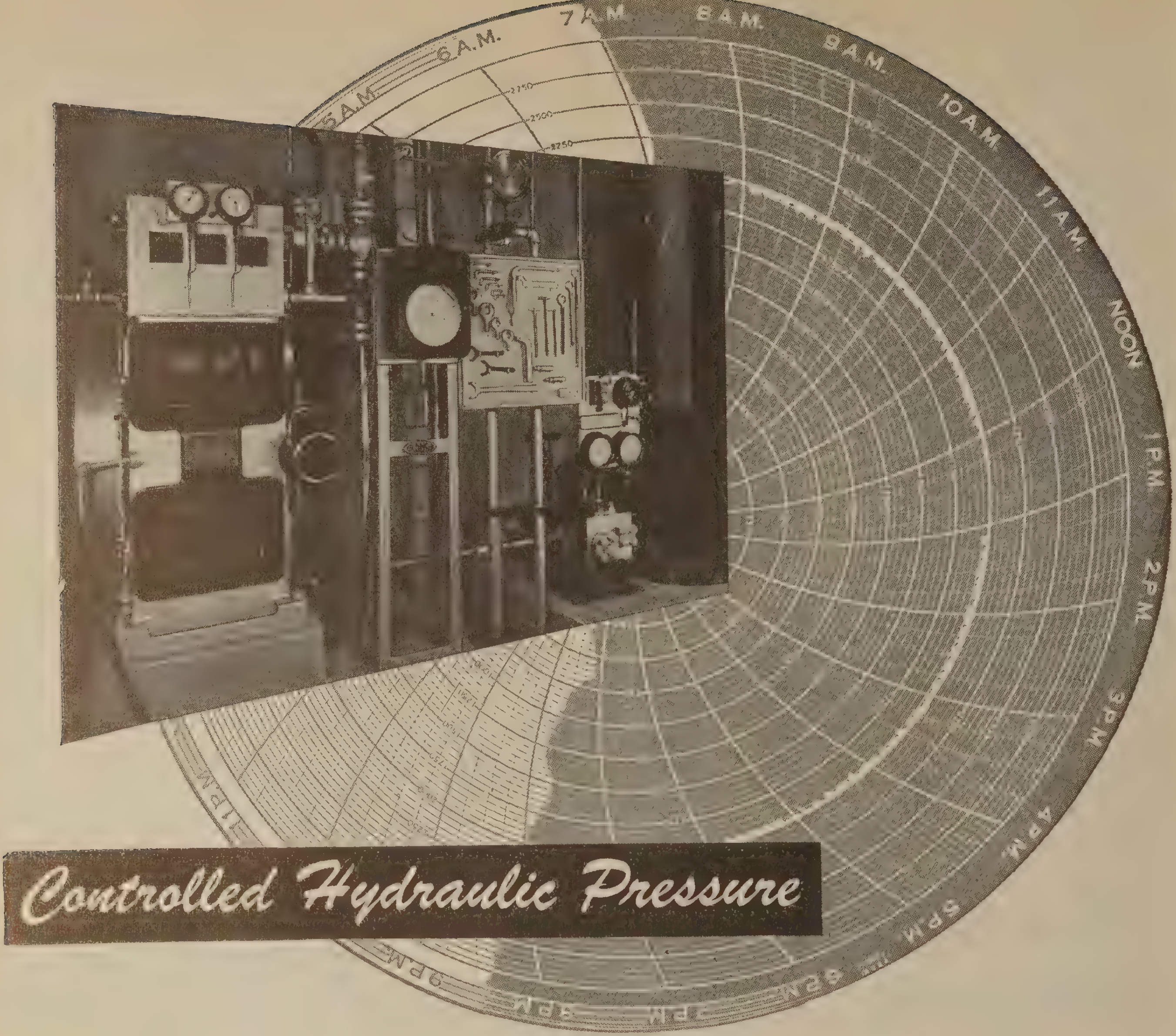
That's what happened with Fafnir's Wide Inner Ring Ball Bearing with the Self-Locking Collar . . . because these bearings were just the thing for all kinds of transmission units . . . pillow blocks, hanger boxes, cartridges and take-up units. A small department became a big one, then a whole floor and finally a brand new plant of a hundred thousand square feet capacity.

Finding a simpler way is the way Fafnir goes at every job. You can see how it has worked in Fafnir housings, in shields and seals and in a hundred details of ball bearing design that make it easier and more economical to use ball bearings. The Fafnir Bearing Company, New Britain, Conn.

MOST COMPLETE LINE IN AMERICA

FAFNIR

BALL BEARINGS



with the ALDRICH-GROFF "POWR-SAVR" Pump

When it comes to maintaining constant hydraulic pressure—you can pat yourself on the back if you've installed an ALDRICH-GROFF "POWR-SAVR" Pump.

Because—the "POWR-SAVR" maintains so constant a pressure that variance does not exceed 2% to 5% of that desired.

Take a look at the pressure chart above. It's an actual record of the hydraulic system at Parker Stearns & Company, manufacturers of rubber and plastics, in Brooklyn, N. Y.—and it shows the practically constant pressure that is maintained by the ALDRICH-GROFF Pump.

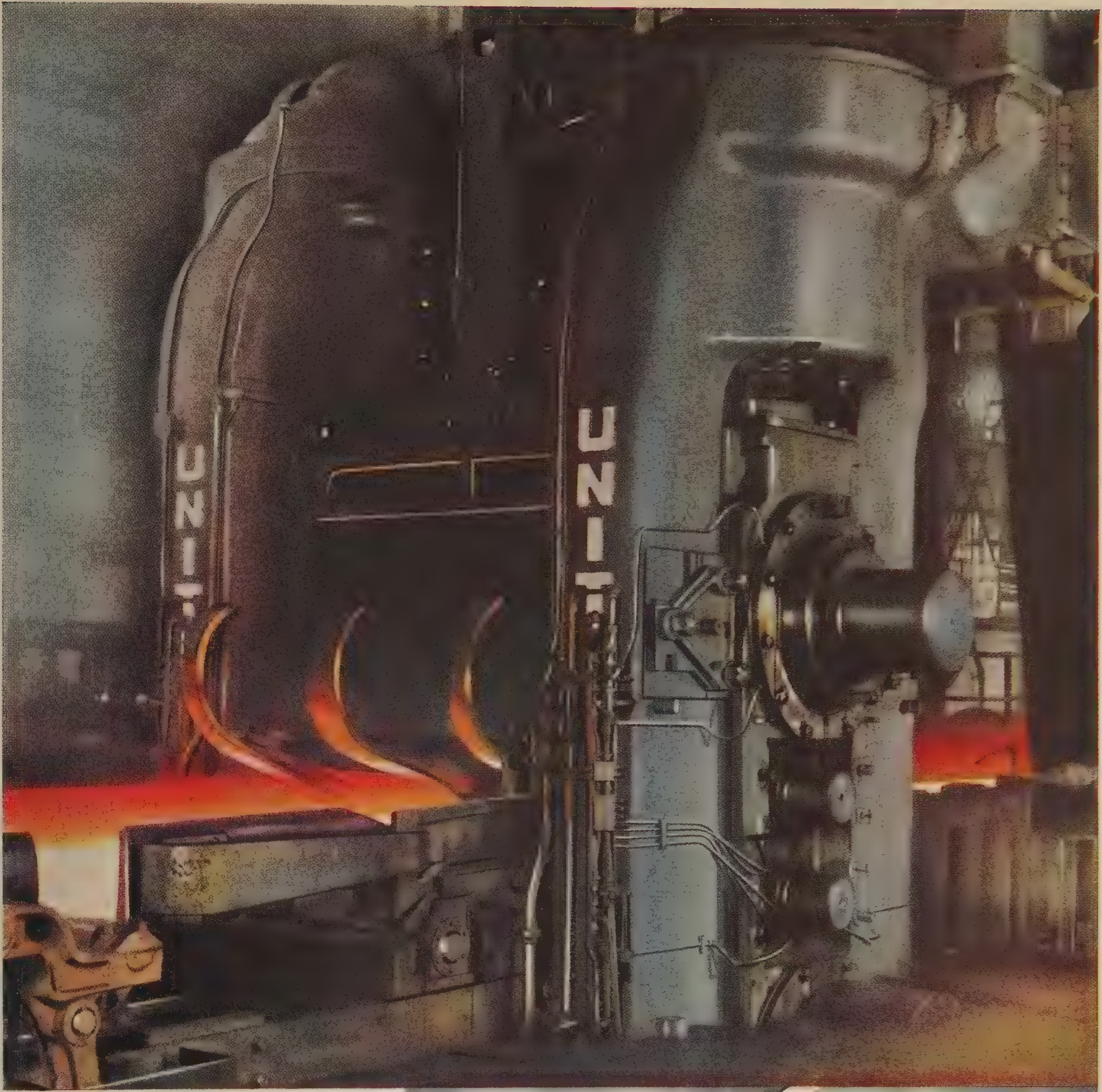
Furthermore, this constant pressure isn't the only feature. The installation, which consists of the "POWR-SAVR" and an Aldrich Centrifugal Pump for prefilling hydraulic presses under low pressure, comprises a *centralized hydraulic system* that serves a large number of presses. This simple system assures compactness, a minimum of investment expense, quick accessibility, easy maintenance and greater operating economy. It also affords ease in adjustment of hydraulic pressure to suit varying requirements.

Write, today, for more information—or guidance on your hydraulic problems.

ALDRICH

THE ALDRICH PUMP COMPANY
8 PINE STREET, ALLENTOWN, PA.

Representatives: Birmingham • Bolivar, N. Y. • Boston • Chicago • Cincinnati • Cleveland • Denver • Detroit Duluth • Houston • Jacksonville • Los Angeles • New York • Omaha • Philadelphia • Pittsburgh • Portland, Ore. • Richmond, Va. • St. Louis • San Francisco • Seattle • Spokane. Wash. • Syracuse • Tulsa



UNITED....

FINISHING STAND, 4-HIGH

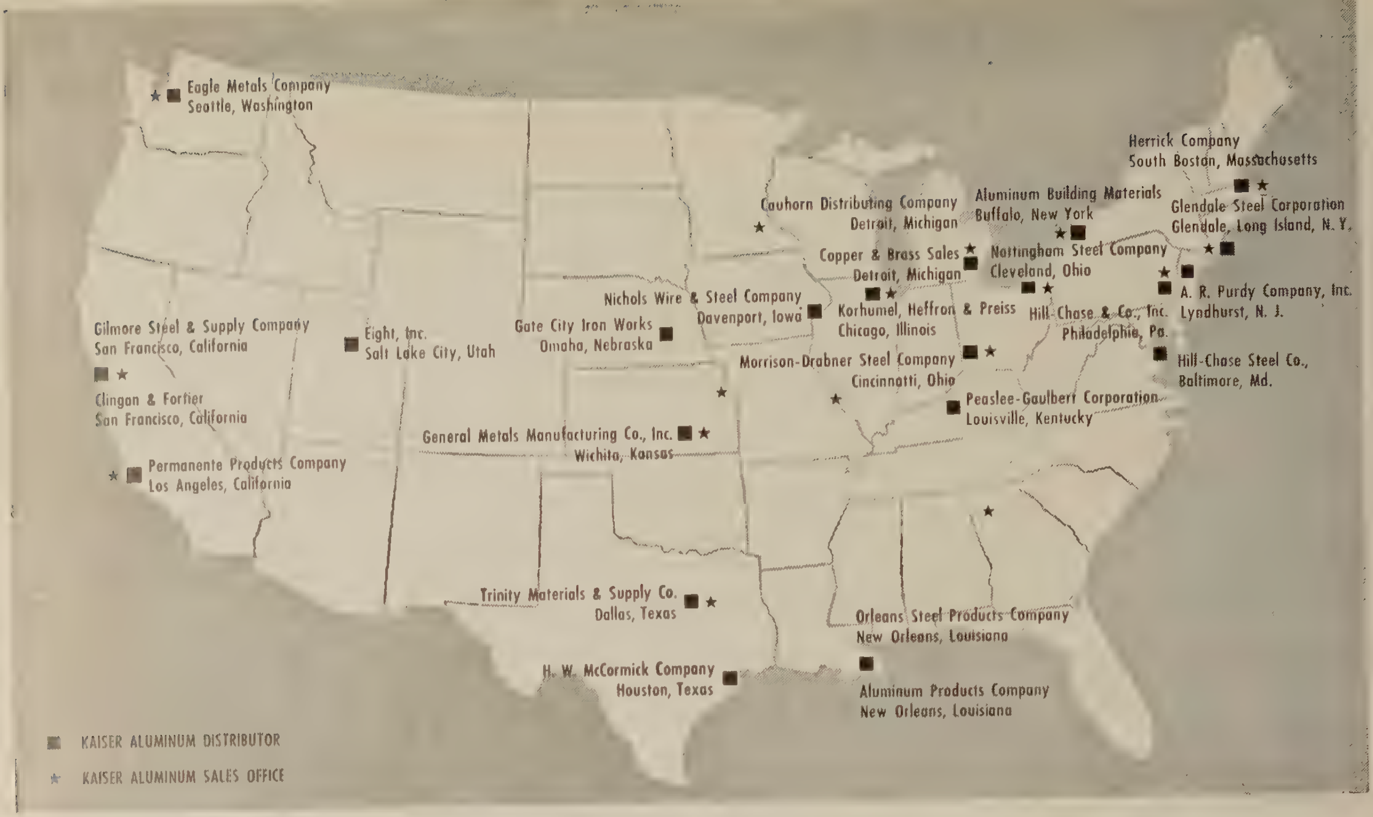
HOT STRIP MILL

UNITED ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

PLANTS AT PITTSBURGH·VANDERGRIFT·NEW CASTLE
YOUNGSTOWN·CANTON
Subsidiary: Adamson United Company, Akron, Ohio
Affiliates:
Davy and United Engineering Company, Ltd., Sheffield, England
Dominion Engineering Works, Ltd., Montreal, P. Q. Canada

UE&FCO
REG. T. M.


Eagle Metals Company
Seattle, Washington
Gilmore Steel & Supply Company
San Francisco, California
Clingan & Fortier
San Francisco, California
Permanente Products Company
Los Angeles, California
Eight, Inc.
Salt Lake City, Utah
Gate City Iron Works
Omaha, Nebraska
Nichols Wire & Steel Company
Davenport, Iowa
General Metals Manufacturing Co., Inc.
Wichita, Kansas
Trinity Materials & Supply Co.
Dallas, Texas
H. W. McCormick Company
Houston, Texas
Cauhorn Distributing Company
Detroit, Michigan
Copper & Brass Sales
Detroit, Michigan
Korhumel, Heffron & Preiss
Chicago, Illinois
Morrison-Drabner Steel Company
Cincinnati, Ohio
Peaslee-Gaulbert Corporation
Louisville, Kentucky
Aluminum Building Materials
Buffalo, New York
Nottingham Steel Company
Cleveland, Ohio
Hill-Chase & Co., Inc.
Philadelphia, Pa.
Herrick Company
South Boston, Massachusetts
Glendale Steel Corporation
Glendale, Long Island, N. Y.
A. R. Purdy Company, Inc.
Lyndhurst, N. J.
Hill-Chase Steel Co.,
Baltimore, Md.
Orleans Steel Products Company
New Orleans, Louisiana
Aluminum Products Company
New Orleans, Louisiana
■ KAISER ALUMINUM DISTRIBUTOR
★ KAISER ALUMINUM SALES OFFICE

Here are your new supply points for Kaiser Aluminum

23 CONVENIENTLY LOCATED DISTRIBUTORS OFFER KAISER ALUMINUM SHEET, PLATE, STRIP, COIL, CIRCLES, ROOFING AND SIDING . . . IN LESS THAN CARLOAD LOTS

Now you can be certain of a close-up source of Kaiser Aluminum . . . *wherever you are located.*

Permanente Products Company is proud to announce the appointment of 23 of the finest material supply houses in the country as distributors of Kaiser Aluminum.

Your local distributor offers complete warehouse stocks of Kaiser Aluminum to meet your immediate needs. No longer need you wait for small carry-over stocks . . . for your local distributor sells in less than carload lots!

This new nationwide network of distributors is in addition, of course, to Permanente Products' 19 sales offices, each ready to help you in solving your engineering problems.

Which means that Permanente Products . . . in only a little over a year of operation . . . now completely rounds out its service facilities . . . to bring you more and better aluminum—*faster!*

Ready to serve you—today . . . 23 conveniently located

Kaiser Aluminum Distributors

PERMANENTE PRODUCTS COMPANY, KAISER BUILDING, OAKLAND 12, CALIFORNIA . . . WITH OFFICES IN:

Seattle • Oakland • Los Angeles • Dallas • Wichita • Kansas City • St. Louis • Atlanta • Minneapolis • Milwaukee • Chicago
Cincinnati • Cleveland • Detroit • Boston • Buffalo • New York City • Philadelphia • Washington, D. C.

BOLTS, NUTS and SCREWS in
BRASS
Delivery in
Two Weeks or LESS!

We are now offering numerous types and sizes of brass fasteners for immediate delivery, including: Machine bolts, cap screws and machine screws in all head styles plus hex nuts and special fastenings. Items not available from inventory, in production run quantities, can be supplied in two weeks from entry of order.

PHONE, WIRE OR WRITE TODAY

STERLING
BOLT
COMPANY

SEND FOR YOUR FREE FASTENING BUYER'S GUIDE

Sterling's new catalog is crammed cover-to-cover with technical information, engineering data and list prices covering virtually every one of the 200,000 metal fastening items used in every industrial field.

- THUMB INDEXED — EASY TO USE
- 124 FULL SIZE PAGES
- IT'S FREE!

STERLING BOLT CO.

203 West Jackson Boulevard, Chicago 6, Illinois

SALES OFFICES:
Union Trust Building, Cincinnati 2, Ohio
17 West Market Street, Indianapolis 4, Indiana
161 West Wisconsin Avenue, Milwaukee 3, Wisconsin
1228 North Hadley Street, St. Louis 6, Missouri

MAIL THIS COUPON TODAY

STERLING BOLT COMPANY
203 West Jackson Boulevard
CHICAGO 6, ILLINOIS

Please send me, without obligation, a copy of your new, easy-to-use catalog. (Please print).

NAME____________________

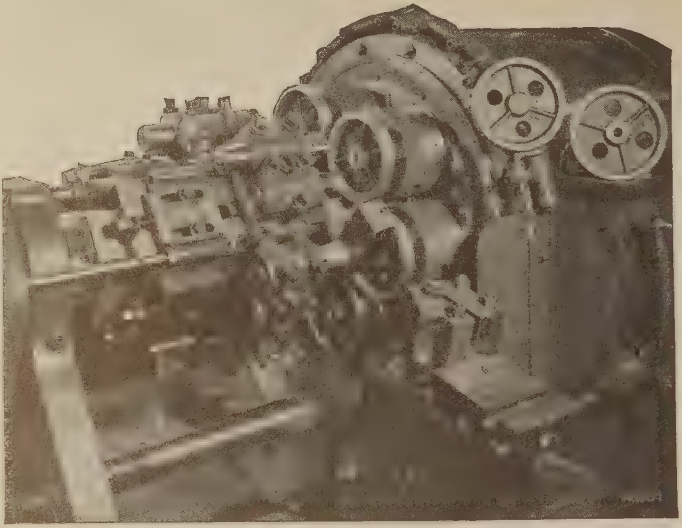
POSITION____________________

FIRM____________________

ADDRESS__________CITY__________STATE__________

FOR HIGH PRODUCTION OF WORK REQUIRING FINE FINISHED SURFACES AND TO CLOSE LIMITS.

BAIRD No. 76H CHUCKER



Here is shown a "Baird" #76H Chucking Machine, set up for turning, facing and boring gear Blanks made of a Special Cast Iron having a Rockwell hardness—85-90 B Scale.

The O.D. is finished turned to 6.800 plus or minus .001 and both faces are finished to 1.000 width, plus or minus .001.

The Hole is finished bored and reamed .750 diameter to plug gage and is concentric with the O.D. turning within .001 total indicator reading.

The work is held in Standard "Baird" Three Jaw Contracting Chucks, using stud type jaws for gripping. (The Spindle Turret is shown partially indexed to better illustrate the method of chucking.)

This gear is completely turned as shown to the required accuracy at the rate of 55 pieces per hour.

Some of the exclusive features which have made this "Baird" 7" six spindle horizontal indexing lathe outstanding are:

INDEPENDENT TOOL SLIDES. The longitudinal tool slides may have different strokes and the cross slides are independent and have their strokes, all as best suits the job. All tool slides have micrometer adjustment.

DIFFERENT SPEEDS AT SPINDLES. Ability to choose a speed for the spindle at each work station to suit the operation to be performed at that station permits of best product in least time.

AUTOMATIC CHUCKING. Operator has both hands free to handle the work. No levers or handles to require his attention or take his time.

ATTACHMENTS. Several readily applied attachments are available to perform extra operations and reduce handling, thus speeding production.

AUTOMATIC MECHANICAL STOP. This stops the machine at the end of each cycle if operator has not unloaded and reloaded in the proper operation of machine. This and other safety features make for least loss due to damage and for greatest safety.

When you have Turning Operations that should be done profitably

"Ask **BAIRD** *About It"*

THE BAIRD MACHINE COMPANY, STRATFORD 9, CONN.

PALLET STACKING MOTO-TRUC

DEPENDABLE POWER

Exide
IRONCLAD

EXIDE-IRONCLAD POWER AND BATTERY ELECTRIC TRUCKS

The efficient, cost-cutting team that speeds materials handling

You gain all along the line when your materials are handled by electric trucks and Exide-Ironclad Battery Power. This modern efficiency team keeps goods moving in greater volume, and saves time and money all day long.

Exide-Ironclad Batteries are preferred for electric truck service because of their great power and dependability . . . a result of special Exide-Ironclad construction, which is unlike that of any other battery.

One important Exide-Ironclad feature is the positive plate which consists of slotted tubes containing the active material. So tiny are these slots that, while permitting easy access of the electrolyte, they prevent the active material from readily washing away. The results are high power ability, longer life, greater economy and safety.

Write us for a FREE copy of Exide-Ironclad Topics which contains "Case Studies" of material handling problems. It tells how to cut handling costs up to 50% . . . covers latest developments in handling materials from receiving to shipping.

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 32
Exide Batteries of Canada, Limited, Toronto

PALLET STACKING MOTO-TRUC

REPUTATION built on REPETITION

. . . that's right . . . repetitive spring action that gives mechanisms life, pep and power . . .

Uniformity to specifications on repeat orders . . .

Job engineering that results repeatedly in production savings on simple or complex spring designs.

Barnes customers are usually "repeat" customers . . . the reasons for which our representatives will be glad to tell. Ask them at the first opportunity.

Wallace Barnes SPRINGS

SMALL STAMPINGS • WIRE FORMS • HAIRSPRINGS • COLD ROLLED SPRING STEEL

WALLACE BARNES COMPANY
BRISTOL, CONN.

DIVISION OF THE ASSOCIATED SPRING CORP.
AND IN CANADA, THE WALLACE BARNES CO., LTD., HAMILTON, ONTARIO

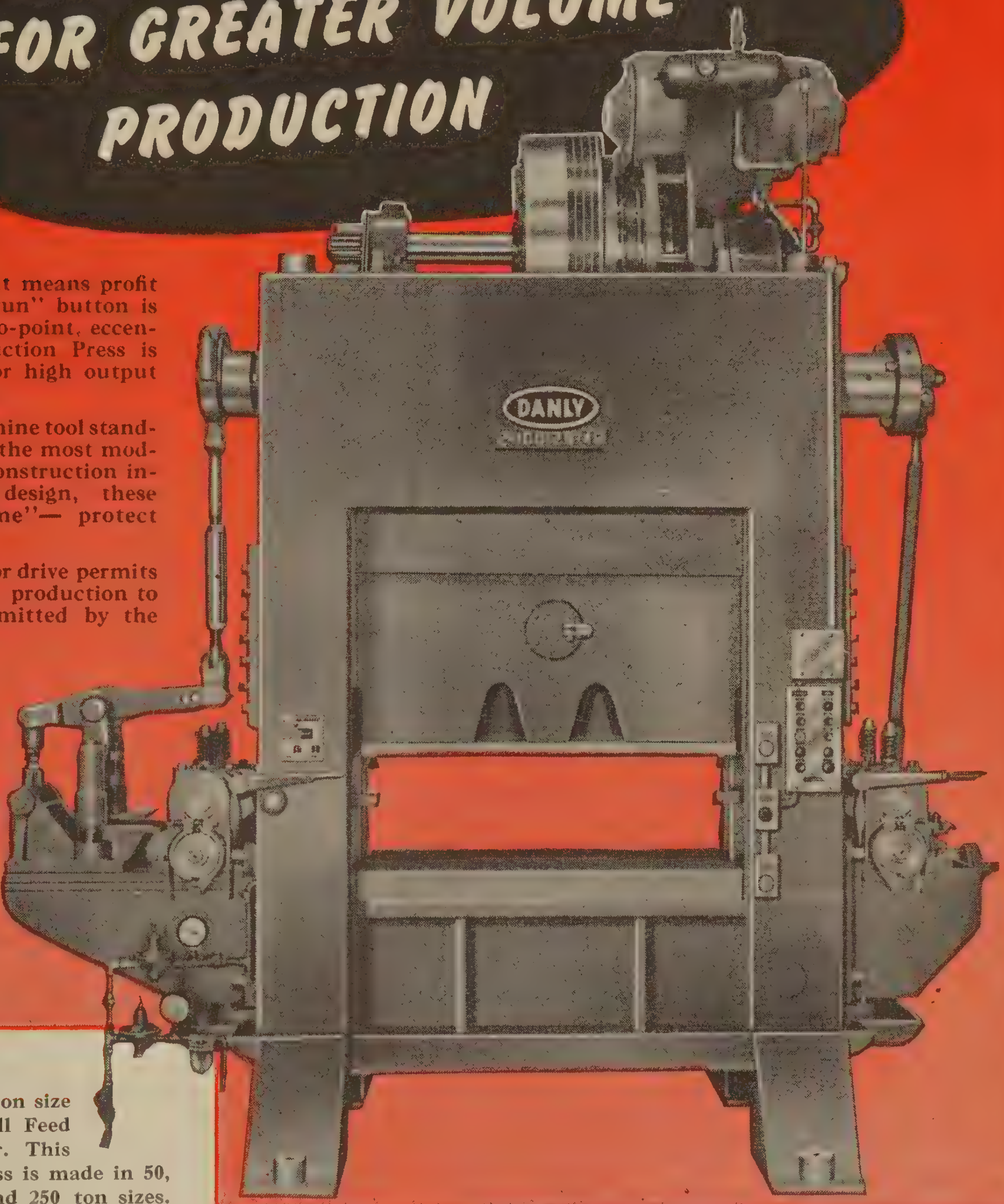
HIGH PRODUCTION PRESSES FOR GREATER VOLUME PRODUCTION

HERE is a press that means profit every time the "run" button is pushed. This Danly two-point, eccentric gear, High Production Press is specifically designed for high output of strip up to ¼" thick.

Sturdily built to machine tool standards of precision, with the most modern features of press construction incorporated in their design, these presses cut "downtime"— protect costly dies.

A variable speed motor drive permits the operator to step up production to the highest speed permitted by the material being stamped.

Compare the features and construction of this line of presses against those of their type with which you are now familiar. Danly's Press Division will be glad to supply more complete information upon request.



Shown is the 100 ton size equipped with Roll Feed and Scrap Cutter. This type of Danly Press is made in 50, 75, 100, 150, 200 and 250 ton sizes. Send inquiries for your requirements to Danly.

DANLY

MACHINE SPECIALTIES, INC.
2100 S. 52nd Avenue, Chicago 50, Ill.

Check and Compare These Features

- Two slide connections for accurate alignment.
- Fully enclosed construction (all weldments thoroughly stress relieved before machining).
- Circulating filtered oil pressure lubrication system. Pressure pump so arranged that press is inoperable until oil pressure builds to operating pressure.
- Variable speed motor drive (50-100 strokes per minute).
- Danly Improved Air-Friction Clutch.
- Flywheel shaft mounted on anti-friction bearings retained in removable pillow blocks provides easy accessibility for maintenance.
- Eccentric Gears, connections and gibs—bronze lined.

THE PRESS FOR MODERN PRODUCTION

We're Delivering *Lighter* Gauge STAINLESS STEEL SHEETS

To your specifications when you want it.

The Washington Steel Corporation is able to supply fabricators with a constant flow of *MicroRold* Stainless Steel Sheets, Type 302 or 304 in a range from 24 to 30 gauge by 36 inches wide by any length.

Many fabricators have specified certain gauges which may be heavier than is actually needed. Now, because of improved cold rolling mill equipment, manufacturers may specify *MicroRold* cold rolled sheet in the actual gauge required for a specific job and be assured of getting a product with virtually no crown and held to a tolerance of plus or minus .001″ of the specification. The "no crown" feature of *MicroRold* Stainless Steel and overall accuracy of gauge means economies as more area or parts per ton of material is realized.*

From regular users now polishing their sheets, we are told that output per ton is often more than doubled.

If we can be of service or if further information is needed, we hope you will call one of Washington Steel's representatives or direct your inquiry to the mill.

***Example of 21% saving**

.012″ × 36″ × 96″ = 24 sq. ft. = 12# @ 62.25¢ lb. = $7.47 = 31.00¢ sq. ft.
.024″ × 36″ × 96″ = 24 sq. ft. = 24# @ 39.50¢ lb. = $9.38 = 39.50¢ sq. ft.

MicroRold STAINLESS STEEL MEANS

Remarkable Accuracy of Gauge
More Area or Parts per ton
Consistant Physical Properties
More Dense Surface Structure
Easier and Less Expensive to Polish

WASHINGTON STEEL CORPORATION

WASHINGTON, PENNSYLVANIA

Broad Street Station Bldg.
Philadelphia 3, Pa.

2565 Guardian Bldg.
Detroit 26, Mich.

1 North LaSalle Street
Chicago 2, Ill.

WHY THE TREND IS TO Mo HIGH SPEED STEELS

Why do makers—and users—of metal-working tools go strong for molybdenum high speed steels?

Performance is one answer. In actual operation, in the form of twist drills, hacksaw blades, milling cutters, lathe bits and many other tools, molybdenum steels have proved that they outperform 18-4-1. They work longer between grinds, and they have longer over-all life.*

Cost is another answer. Molybdenum steels cost from 10¢ to 20¢ a pound less than 18-4-1, and they provide more tools per pound of steel because their density is 6% to 9% lower.

Many of the country's largest users of high speed steels have standardized on molybdenum steels. They have done it because they know that the use of these modern steels lowers production costs.

*Our booklet on molybdenum high speed steels will give you proof of these statements. Write for it.

MOLYBDIC OXIDE—BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"
CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.

Climax Molybdenum Company
500 Fifth Avenue • New York City

THE FIRST AND LAST WORD IN ELECTRICAL TOOLS

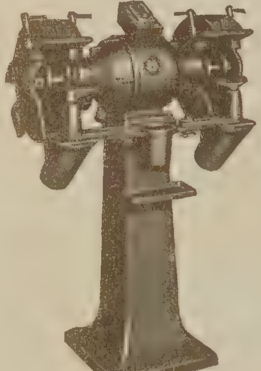
United States Electrical Tools

THE FIRST WORD because the original electrical tools invented by Col. John A. Smith were the beginnings of the industry fifty years ago . . . this is our Golden Anniversary Year.

THE LAST WORD in precision engineered design, construction and performance, constantly improved to fit the manifold demands of all industry.

■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■

UTILITY FLOOR GRINDER



MODEL 500

Model 500
Ball Bearing

12, 14 and 18″ wheels. Totally enclosed motor; push button starter for overload protection, ball bearing enclosed in dust-tight housings, enclosed adjustable wheel guards.

■ ■ ■ ■ ■ ■

YOUR JOBBER CAN SUPPLY YOU

Tools and accessories are carried in stock by the most dependable jobbers in your area . . . their salesmen can help you select the proper tool for the job, as well as thousands of other items. Buy from your local jobber and enjoy his convenient, economical service.

THE UNITED STATES ELECTRICAL TOOL CO. · OUR 50th YEAR · CINCINNATI, OHIO

The UNITED STATES ELECTRICAL TOOL Co.
CINCINNATI, OHIO

PITTSBURGH SPUR GEARS

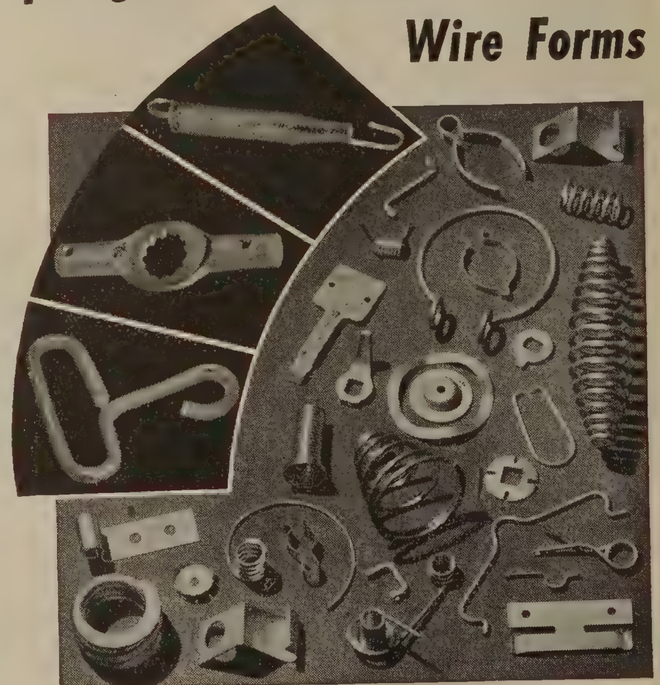
There's a good reason why PITTSBURGH Spur Gears give longer, trouble-free service. Engineering and production "know-how" plus scientific heat treatment are the answer. Furnished from 24 to 1¼ DP, with diameters from 1½″ to 75″; face widths to 20″. Inquiries invited.

Specify PITTSBURGH
HELICALS · INTERNALS
BEVELS
SPURS · WORMS
SPECIALS

PITTSBURGH GEAR
AND MACHINE COMPANY | 27th & Smallman Streets
PITTSBURGH 22, PA.

PIONEER PRODUCER OF QUALITY GEARS

Springs, Stampings Wire Forms



ESTABLISHED 1905
HUBBARD

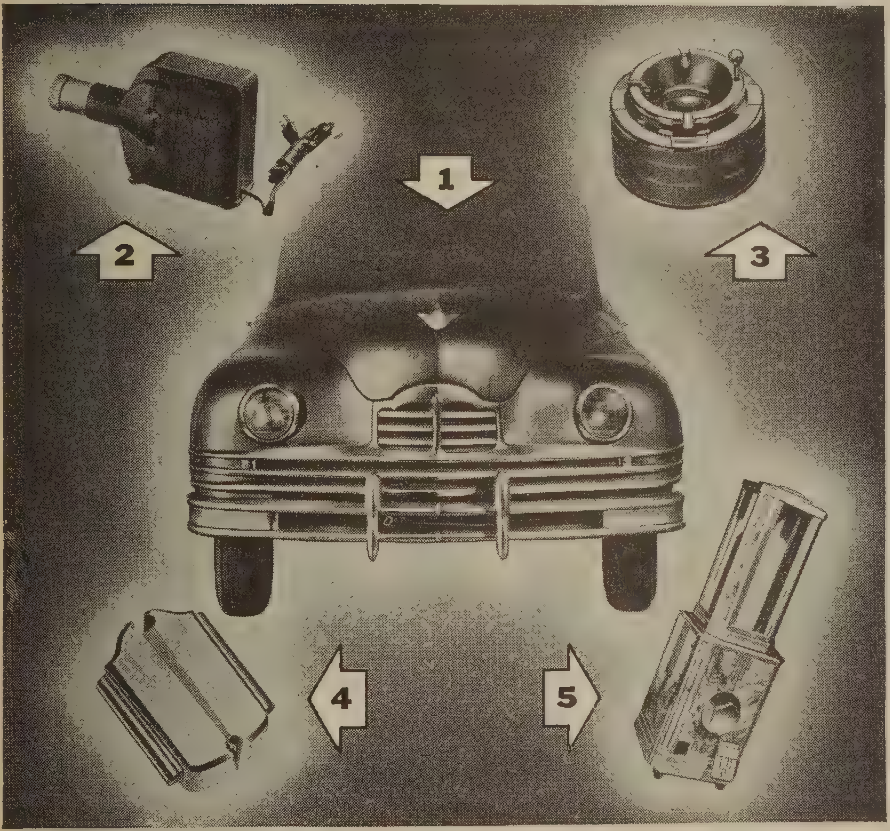
M. D. HUBBARD SPRING CO.
SPRINGS · STAMPINGS · WIRE FORMS
WASHERS · COTTERS · EXPANSION PLUGS

325 CENTRAL AVE. PONTIAC 12, MICH.

Why ARE ZINC DIE CASTINGS THE MOST WIDELY USED?

FINISHABILITY *for one thing*

Zinc is the only commonly used die casting metal which can be easily and economically finished by almost any known type of commercial finishing process. Aside from the adaptability of the metal to both electrodeposited and organic coatings, the as-cast surfaces and precise detail of zinc die castings require an absolute minimum of preparation for finishing. Finishability is just one of the many reasons why zinc has for many years been the most widely used die casting metal.



Pictured here are a number of current product designs utilizing ZINC die castings finished in a variety of ways:

1. **CHROMIUM PLATE**
   All of the chromium plated parts on the front end of this car (with the exception of the bumper) are zinc die castings.
2. **WRINKLE ENAMEL**
   The entire housing of this slide projector is composed of just two zinc die castings, attractively finished with a black wrinkle enamel.
3. **PLATE AND ENAMEL**
   The designers of this efficient ash receiver have achieved an interesting effect by finishing the zinc die cast receptacle with a baked enamel to contrast with the plated top castings.
4. **SATIN BRASS PLATE**
   This gracefully shaped door chime housing is a one-piece zinc die casting finished in a handsome satin brass plate, with polished edges for contrast.
5. **DECALCOMANIA**
   A photo-lithographic film coating has been applied to the zinc die cast surfaces of this peanut vending machine to create a marble effect. Molded plastic coatings are also frequently used on zinc die castings.

Ask your die casting source for our booklet "The Finishing of Zinc Alloy Die Castings"—or write directly to us.

You probably know the zinc die casting alloys by the trade name, Zamak. The New Jersey Zinc Company developed alloys of specific compositions for the die casting industry and gave them this name. Zinc alloys of these compositions are the only ones used for die casting. Your die caster exercises careful control in the formulation of these alloys to assure maximum mechanical properties and dimensional stability.

ZINC
FOR DIE CASTING ALLOYS

THE NEW JERSEY ZINC COMPANY, 160 Front St., New York 7, N. Y.

The Research was done, the Alloys were developed, and most Die Castings are based on
HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

THE KING PORTABLE BRINELL

A hardness tester particularly adapted for use on CASTINGS and FORGINGS

Puts an actual load of 3000kg on a 10mm ball.

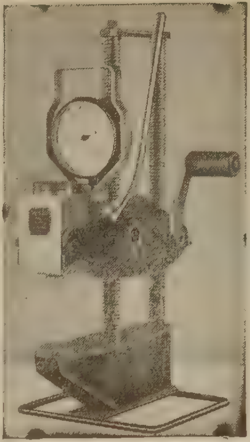
Throat, 4" deep.
Gap, 10" high.
Weight, 26 lbs.

Can be used in any position—even upside down.

Equally accurate as portable or stationary equipment.

Test head removable for testing larger pieces beyond the capacity of the standard base.

ANDREW KING
524 Broad Acres Rd., Narberth, Penna.

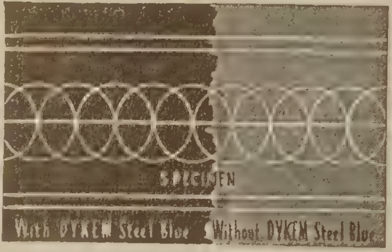


CHICAGO
STEEL PRESS BRAKES
and
HAND and POWER BENDING BRAKES
and
DIES FOR ALL STANDARD MODERN PRESS BRAKES

DREIS & KRUMP MFG. CO.
7430 LOOMIS BLVD • CHICAGO 36, ILLINOIS
Send for New Book "Forming Press Dies and Their Uses"

DYKEM STEEL BLUE

STOPS LOSSES
making dies & templates



Simply brush on right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed layout lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

Write for full information

THE DYKEM COMPANY, 2303G North 11th St., St. Louis 6, Mo.
In Canada: 2466 Dundas St. West, Toronto, Ont.

KEEP PRODUCTION ROLLING ON BEARINGS FROM L & S

TWO-FOLD SOURCE OF SUPPLY — L & S manufactures radial, thrust, roller bearings, and pillow blocks.—L & S is distributor for other manufacturers.

WRITE TODAY—List quantity, numbers and brands of bearings you need.

Write Today

L & S BEARING CO.
Dept. M-6 P.O. Box 1072 7-5501
OKLAHOMA CITY

THE BELMONT IRON WORKS
Structural Steel — Buildings & Bridges
Riveted — Arc Welded
Cable Address — Beliron
Engineers — Fabricators — Erectors — Contractors — Exporters
SHOPS: PHILADELPHIA—EDDYSTONE—ROYERSFORD
Main Office: Phila. 46, Pa.
New York Office: 44 Whitehall St., N. Y. 4, N. Y.

Certified **MALLEABLE IRON** *Castings*

Detachable and Riveted Sprocket Chain, Malleable Washers, Tank Lugs, Oarlocks. Catalogues on request.

PEORIA MALLEABLE CASTINGS CO.
PEORIA, ILLINOIS, U. S. A.

HOT DIP GALVANIZING
SOUTHERN GALVANIZING CO.
BUSH STREET AND B.&O.R.R., BALTIMORE, MD.
Ideally located for export
LOW RAIL AND WATER RATES, EAST AND WEST

Hartford **STEEL BALLS**
A PRODUCT OF INGENIOUS MACHINERY AND SKILLED CONNECTICUT OPERATORS
STEEL, BRONZE, MONEL, STAINLESS STEEL AND ALL WORKABLE MATERIALS
Any Quantities... THE HARTFORD STEEL BALL CO., HARTFORD 6, CT.

WIRE AND METAL RIBBON
FORMING MACHINERY
NILSON TILTING
WIRE REELS
(Wire Reel Catalog No. 51)
Special Machines Designed and Built to Order
THE A. H. NILSON MACHINE COMPANY BRIDGEPORT, CONN.

SINCE 1832
Bradley
The name to remember for CUSHIONED POWER HAMMERS
C.C. BRADLEY & SON, INC. Syracuse, N.Y.

FOR NEW
PRODUCTION IDEAS
READ
THE ADVERTISING PAGES OF THE IRON AGE

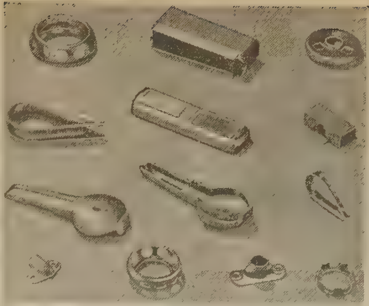
- MACHINE TOOL & TOOLING
- COMPONENT PARTS
- MATERIALS HANDLING
- PLANT SERVICE EQPT.
- FASTENING & JOINING PRODUCTS

WEBB WIRE

STRENGTH UNIFORMITY DURABILITY
REG. U.S. PAT. OFF.

NEEDLE and STAINLESS

THE WEBB WIRE WORKS
NEW BRUNSWICK, N. J.
PHONE 2-4668-9

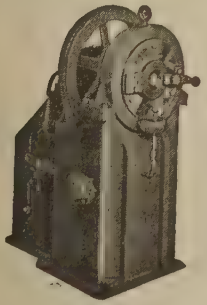


Better
DIES and STAMPINGS

Any Material
Any Quantity
Prompt Delivery

- Send Us Your Blue Prints and Specifications

THE H AND P DIE and STAMPING CO
13943 TRISKETT ROAD • CLEVELAND 11, OHIO

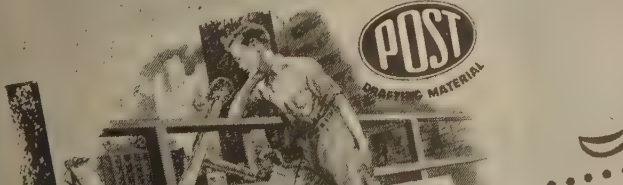


THE TORRINGTON ROTARY SWAGING MACHINE

— with 4000 forceful squeezing hammer blows per minute—makes metal tougher and more elastic. Send for booklet—"The Torrington Swaging Machine."

The Torrington Co., Swager Dept.
56 Field Street
Torrington, Conn.

PERFORATED METALS
FOR ALL INDUSTRIAL USES
●
PERFORATIONS IN HEAVY PLATES
ARCHITECTURAL GRILLES
●
DIAMOND MFG. CO.
BOX 28 WYOMING, PA.
WRITE FOR CATALOG 35


POST
DRAFTING MATERIAL
THE FREDERICK POST COMPANY
Phone: Keystone 7000
INDIA DRAWING INK
IT'S THE BEST!
SUNDAY MONDAY TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY
9 10 11 12 13 14 15
MARCH

It's yours for the asking!...

Giant Size Dates Week by Week

- Easy to read at a glance—overall size 12 x 20".
- Each weekly page includes full current past and future month.
- Beautiful, Inspirational four color illustration, spiral bound.
- Engineering data covering charts on wire and sheet metal gages, screw threads, bolt heads, pipe and pipe fittings, gears, metric equivalents and complete 12 month calendar.

FREE

DRAFTING MATERIALS

POST

THE FREDERICK POST COMPANY
3650 North Avondale Avenue • Chicago 18, Illinois
Detroit • Houston • CHICAGO • Los Angeles • Milwaukee

REQUEST FOR 1948 CALENDAR

Name__________

Company__________

Address__________

City__________ State__________

PLATE BENDING ROLLS

Capacities ~ Lightest sheet to heaviest plate

Our Line

Light and heavy machinery for all classes of sheet metal, plate and structural work

BERTSCH & COMPANY

Cambridge City Indiana

COWLES

GANG SLITTING KNIVES

STANDARD for SERVICE and DURABILITY. Ground to extremely close Tolerances and Finish.
Made by TOOLMAKERS.

COWLES TOOL COMPANY
CLEVELAND 2, OHIO

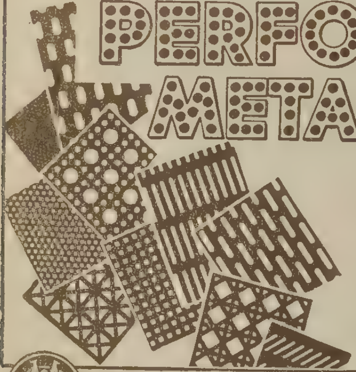
"NEWARK GEAR"

Gear Cutting Machines

●

NEWARK GEAR CUTTING MACHINE CO.
69 Prospect St., Newark, N. J.

PERFORATED METALS for Every Purpose



Write for New Catalog of Patterns

Steel, Brass, Copper, Monel, Bronze, Aluminum, Zinc, Lead, Stainless Steel and all metals or materials punched as required and for all kinds of screens. We can guarantee perfectly flat sheets free from buckles and camber.

CHARLES MUNDT & SONS
59 FAIRMOUNT AVENUE JERSEY CITY, N. J.

STAMPED METAL PARTS

for the aviation industry requires production "on time" — and to specifications! Our experience — serving leading industrial firms since 1883 — is your guarantee of a dependable source of supply. Stampings from steel, brass and aluminum.

Send blueprints or samples for quotation.

WORCESTER STAMPED METAL CO.
Established 1883
'0 HUNT STREET • WORCESTER, MASS.

Specialists in Blast Furnace and All Types of Firebrick Construction Work

A. E. ANDERSON CONSTRUCTION CORPORATION
1720 MILITARY ROAD
P. O. BOX STATION B, BOX 36, BUFFALO, N. Y.

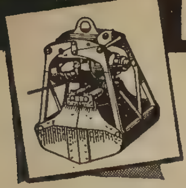
NICHOLSON ARBOR PRESSES

Save Time IN ASSEMBLY, BENDING, BROACHING

They are always ready to go to work because they are: simple and never out of order; compact and easily portable; quickly adaptable to any job; and always ready to deliver SMOOTHLY the necessary power. 5 sizes for light to heavy work. BULLETIN 845.

Other Products: Expanding Mandrels, Traps, Control Valves, etc.

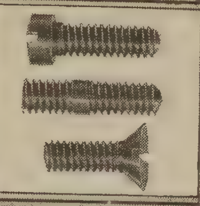
W. H. Nicholson & Co., 165 Oregon St., Wilkes-Barre, Pa.



HAYWARD BUCKETS

Use this Electric Motor Clam Shell for rehandling bulk materials in Industrial Plants.

THE HAYWARD CO., 40-50 Church St., N.Y. —NAYCO—



SCREW MACHINE PRODUCTS

Cap and Set Screws

WM. H. Ottemiller CO.
YORK, PENNA.

MADISON WIRE CO., INC., Buffalo 20, N. Y.

Steel **WIRE** *Low Carbon*

BRIGHT, LIQUOR, COPPERED

SIZES 18 TO 34 *W & M GAUGE*

Cutting Off Machines for Sawing All Kinds of Metals

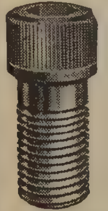
THE ESPEN-LUCAS MACHINE WORKS
FRONT AND GIRARD AVE., PHILADELPHIA, PENNA.

THE CLEVELAND STEEL TOOL CO.

Punches, Dies, Chisels, Rivet Sets

660 E. 82D St. Cleveland, O.

If it's RIVETED you KNOW it's safe



"Unbrako" Knurled Socket Head Cap Screw

Reg. U. S. Pat. Off.

UNBRAKO

"Unbrako" Set Screw with Knurled Cup-Point

FREE SAMPLES FOR DOUBTING THOMASES
DEALERS EVERYWHERE—PROMPT DELIVERIES

STANDARD PRESSED STEEL CO.
Box 523 Jenkintown, Pa.

STEEL from STOCK

BARS • STRUCTURALS • PLATES
SHEETS • COLD FINISHED • ETC.

Write for Monthly Stock List

AMERICAN PETROMETAL CORP.
BROADWAY AT 11th ST., LONG ISLAND CITY 1, N. Y.

PRESSES
FEEDS
AUTOMATIC EQUIPMENT

The
V & O PRESS COMPANY
HUDSON, NEW YORK

PERFORATED METAL *Screens*

Copper • Steel
Monel • Stainless Steel
Chemical Resisting Alloys

Precision perforations in all sizes for large production and screen durability.

The Harrington & King PERFORATING Co.

5657 Fillmore St., Chicago 44, Ill.
114 Liberty St., New York 6, N. Y.

L&J SINCE 1911

Inclinable

PUNCH PRESSES

5 to 79 Tons Capacity

WRITE FOR CATALOG

L & J PRESS CORP. *Elkhart, Ind.*
1631 STERLING AVE.
SUCCESSORS TO LOSHBOUGH JORDAN TOOL & MACHINE CO

METAL STAMPINGS • WIRE FORMS

Just a few of the more than 7000 catalog items we manufacture.

What do YOU need?

EASTERN TOOL & MFG. CO.
General Office: BELLEVILLE 9, N. J.

GRIFFIN

COLD ROLLED
STRIP STEEL

1/2" TO 19" WIDE
.002" TO .500" THICK
DESIRED QUALITY FOR FORMING AND DRAWING

GRIFFIN MFG. CO.
ERIE PENNA

SALES AGENTS

NEW YORK CITY — Wm. H. Leonori & Co., Inc., 30 Howard St.
CHICAGO — Central Steel & Wire Co., 3000 West 51st St.
DETROIT—D. S. Wegener, Boulevard Bldg., 7310 Woodward Ave.
BUFFALO — J. J. Lambert, 328 Huntington Ave.
CINCINNATI 14—Central Steel & Wire Co., Box 148 Annex Station.
SAN FRANCISCO — Charles L. Lewis, 703 Market St.

HOT DIP GALVANIZING

Philadelphia's Oldest. The Country's largest Hot Dip Galvanizer. We have the most modern equipment to do first-class galvanizing at lowest prices. Galvanized products furnished.

Galvanizing since 1867

JOSEPH P. CATTIE & BROTHERS
Gaul & Letterly Streets, Philadelphia, Pa.

GOSS and DE LEEUW

MULTIPLE SPINDLE

CHUCKING MACHINES

Four, Five, Six, Eight Spindles • Work and Tool Rotating Type

GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

FELLOWS

Fellows

MACHINES AND TOOLS FOR GEAR PRODUCTION

The Fellows Gear Shaper Company, Springfield, Vt.

WETHERELL BROS. CO. STEEL ESTABLISHED 1870

WETHERELL BROS. CO.
251 Albany St., Cambridge, Mass.

C. R. Strip Stainless Steel
Tool Steel O. H. Specialties

PERFORATED METALS—SCREENS

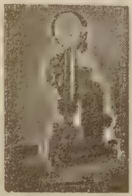
Any size perforation — any gauge steel. Promptly made to your exact specifications.

CHICAGO PERFORATING CO.
2440 W. 24TH PLACE Tel. Canal 1459 CHICAGO, ILL.

Zinc

STRIP, COILED
WIRE, COILED
ACCURATELY ROLLED FOR ELECTRIC FUSE ELEMENTS
EYELETS — BRASS, STEEL AND ZINC

THE PLATT BROS. & CO., WATERBURY, CONN.



THE INTERNATIONAL HARDNESS SCALES
(BRINELL-SHORE)

are included in Our Improved Portable Scleroscope Model D-1. This efficient Single Scale tester registers Brinell-Shore values under otherwise inaccessible conditions. 100% portable for floor and field work, dead soft metals or superhard steel either of brittle or thin cross sections, non-destructive, accurate, speedy, always ready and fool-proof.

Send for Interesting Technical Bulletin and Prices.

THE SHORE INSTRUMENT & MFG. CO., INC.
9025 Van Wyck Ave., Jamaica, N.Y.

MICHIANA PRODUCTS CORP.

MICHIANA

See Display Ad in Jan. 8th 1948 Issue

HEAT- and CORROSION-RESISTANT ALLOYS

MICHIGAN CITY, INDIANA

LELAND-GIFFORD COMPANY
Worcester, Mass.
Drilling Machinery
Belt and Motor Spindle
One to Six Spindles
Tapping Attachments and Multiple Heads

STANLEY STEEL

STEEL MAKERS SINCE 1871

HOT ROLLED COLD ROLLED SPECIAL CARBON ALLOYS

THE STANLEY WORKS
NEW BRITAIN, CONN. • BRIDGEPORT, CONN. • HAMILTON, ONTARIO

Famous for

- ACCURACY OF THREADS
- LOW CHASER COST
- ALL AROUND DEPENDABILITY

Bulletins available: General Purpose Die Heads, Insert Chaser Die Head. Threading Machines.

H & G DIE HEAD

See our Adv. on page 210 Nov. 6 Iron Age

THE EASTERN MACHINE SCREW CORP., 21-41 Barclay St., New Haven, Conn.
Los Angeles: A. C. Behringer, 334 N. San Pedro St.; San Francisco: Guy Reynolds, 464 Vernon St., Oakland. Canada: F. F. Barber Machinery Co., Toronto, Canada.

LOCOMOTIVE CRANES
GASOLINE – DIESEL – ELECTRIC OR STEAM

OHIO

The OHIO LOCOMOTIVE CRANE CO. BUCYRUS, OHIO

Read

The Advertising Pages

for

- ★ metals
- ★ metal parts
- ★ metal treating products
- ★ machine tools
- ★ misc. metalworking machinery
- ★ steel mill equipment
- ★ fastening & joining products
- ★ cleaning & finishing products
- ★ materials handling equipment
- ★ power transmission products
- ★ plant service equipment
- ★ engineering services & products

America's Leading Manufacturers of all these products are represented in

THE IRON AGE

CONSIDER GOOD USED EQUIPMENT FIRST

AIR COMPRESSORS
16" x 9¾" x 10" Sullivan Class WJ-3 Air Compressor. Equipped with 100 H.P. G.E. A.C. Motor
15½" x 9½" x 10" Pennsylvania Class DCE2 Air Compressor. Direct Connected to 125 H.P. A.C. Motor. Complete with After-Cooler, Air Filter, Air Receiver, etc.

ANGLE BENDING ROLL
No. ½ Buffalo Horizontal Angle Bending Roll, Capacity Angles—leg out 2 x 2 x ¼", leg in 1½" x 1½" x ¼". Motor Driven

BALER
HPM Scrap Metal Baler, Box Size 24 x 16 x 66. Self-contained, complete with motor

BAR BENDING MACHINE
Air Operated "U" Bolt Bending Machine, Complete with attachments. Dies for forming 2⅜" round and 1¾" Round Stock

BAR TURNING MACHINES
Medart Bar Turning Machine, Motor Drive, Type A Capacity to turn bars 1" to 4" incl.
Medart Bar Turning Machine, Motor Drive, Type B Capacity to turn bars 3" to 6" incl.

BENDING ROLLS
12' x 1½" Vertical Bending Roll, Arr. Motor Drive

20' WICKES PLATE BENDING ROLL
PYRAMID TYPE
CAPACITY 1" PLATE FULL WIDTH
MOTOR DRIVEN INCL. ELECL. EQUIP.

BOLT FORGING MACHINE
1¼" Pawtucket Bolt Forging Machine, M.D. Diameter of Shank 1 5/16"

BRAKE—LEAF TYPE
8' x 12 Ga. Dreis & Krump Leaf Type Brake. Equipped with air cylinder for pneumatic operation.

BRAKE—PRESS TYPE
10' Henderson Press Brake, Motor Driven Incl. 30 H.P. Motor. Capacity ½" Plate

CRANE—CRAWLER
Model 1426 SPEEDCRANE, Full Revolving, Mounted on Crawler Treads, Gasoline Operated, 65' Sectional Boom. Capacity 6500# at 45' radius to 35,200# at 13' radius

CRANE—GANTRY
5 ton Gantry Crane 110' Span, 440/3/60
5 ton Niles Gantry Crane 85' Span Three 230 Volt D.C. Motors
Type J McMyler Gantry Crane, 55 Ft. Boom Capacity 10,000# at 50' Radius to 50,000# at 12' Radius

CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P & H	37'6"	Span 440 Volt AC
5 ton Maris	30'6"	Span 220 Volt AC
5 ton OET	35'	Span 230 Volt DC
10 ton OET	43'	Span 230 Volt DC
10 ton Morgan	48'8"	Span 230 Volt DC
10 ton Morgan With Two Trolleys	80'	Span 230 Volt DC
15 ton P & H	40'	Span 230 Volt DC
15 ton Alliance	48'	Span 550 Volt DC
20 ton Whiting With 5 ton Auxiliary	75'	Span 440 Volt AC
25 ton Box With 5 ton Auxiliary	41'7½"	Span 230 Volt DC
25 ton P & H With 5 ton Auxiliary	48'2"	Span 230 Volt DC
25 ton Box With 5 ton Auxiliary	49'1½"	Span 230 Volt DC

CUT-OFF MACHINES
Model ME-1 Dewalt Hi-Speed Cut Off Machine. Capacity 4" Dia. Bars
No. 4 Taylor Wilson Cut Off Machine. Capacity 6⅝" to 14" O.D.
No. 2 Taylor Wilson Cut Off Machine, Capacity 2" to 6⅝" O.D.

FLANGING MACHINES
No. 6 Blue Valley Flanging Machine, Motor Driven. Capacity 24 ga. to ⅝" thick, 30" to 20' Diameter
Blue Valley Flanging Machine. Motor Driven. Capacity 10 ga. to 5/16" thick, 4' to 12' Diameter

FORGING MACHINES
1", 2½", 3½", 5", 6", 7", 8" Ajax
1½" Acme, 1¼" Pawtucket
3" Acme Model XN—Late Type
5" Acme Model XN—Late Type

FURNACES
#4 U. S. Rotary Melting Furnace 2000 lb. Equipped with natural gas burner
2-4 ton Heroult Electric Melting Furnace Complete with Transformer Equipment
10 ton Moore Size NT Rapid Lectromelt Furnace. Complete with Transformer & Accessories

GEAR HOBBING MACHINES
120-H Gould & Eberhardt Universal, Motor Drive. Change gears to cut diversified range of spur, single & double helical gears
No. 5B Sykes Gear Generator, Motor Driven. Will cut a gear from 3" to 61" dia. by 18" wide on spur and 21" on Herringbone. New 1945

GEAR REDUCERS
600 H.P. Westinghouse Reduction Unit Ratio 3.76-1 With 600 H.P. Westinghouse A.C. Motor
500 H.P. Mesta Double Reduction Ratio 11:1
1000 H.P. Falk Double Reduction Ratio 29:1
1200 H.P. Falk Double Reduction Ratio 29:1

HAMMERS—BOARD DROP
800# Chambersburg, Motor Driven
3500# Chambersburg
4000# Erie
4000# Chambersburg Model F
4000# Billings & Spencer Model E
6500# Billings & Spencer Model E

HAMMERS—NAZEL
#5-B Nazel Hammer, Motor Driven. Capacity 6" Square

HAMMERS—STEAM DROP
700# Chambersburg, Air Operated
1000# Chambersburg
1250# Chambersburg
2000# Chambersburg
2500# Chambersburg Style E—NEW 1944
4000# Erie—NEW 1942
5000# Erie—NEW 1942

HAMMERS—STEAM FORGING
200, 400, 500, 600, 750, 1000# Chambersburg
1100, 1500, Niles-Bement-Pond
3000# Chambersburg Double Frame
4500# Chambersburg, Single Frame
6000# Chambersburg, Double Frame

INGOT ROTATOR
50 ton Forge Ingot Rotator

LATHES—ENGINE TYPE
12"x54" Monarch Model KK 16 Speed Helical Geared Timkenized Engine Lathe, Incl. Motor & Control
16" Wickes 8 Speed Engine Lathe, Motor Driven

MANIPULATOR
5 ton Alliance Straight Line Manipulator

MILLING MACHINE—PLANER TYPE
Newton Adjustable Rail Planer Type Milling Machine, Motor Driven Table 30" x 18' 3½", working surfaces 24" x 17' 7"

PIPE OR TUBE MILLS
Wellman Seaver Seamless Pipe or Tube Mill, Range ¾" to 4½" O. D. Hot Rolled Seamless

PLANERS
42" x 42" x 14' Rockford Hydraulic Four Head Planer Motor Driven

PLANER—OPEN SIDE
48" x 48" x 12' Liberty Openside Planer, Two Rail Heads, One Side Head

PRESS—TRIMMING
#8 Erie Trimming Press. 8¾" Stroke 22" x 20" Bed Area. 3" Stroke of Side Shear
#3 Billings & Spencer Trimming Press. Distance between uprights 18" x 22½"

PUNCH—HORIZONTAL
No. 1 Hilles & Jones Horizontal Punch, Capacity ⅞" thru ¾"

PUNCH & SHEAR COMBINATIONS
No. 3 Hilles & Jones, Single End, Belt Drive, 36" Throat, Capacity Punch 1¼" thru 1"
Style C Cleveland, Single End, Belt Driven, 24" Throat, Capacity Punch 13/16" thru ¾"
Style EF Cleveland, Single End, Motor Driven 36" Throat, Capacity Punch 1¼" thru 1"

ROLLING MILLS
6 x 3" Spencer Single Stand Two High
8 x 4½" McWilliams Single Stand Two High
10 x 12 Single Stand Two High
16 x 20" Waterbury Farrel Single Stand Two High
16½ x 30 Mesta Single Stand Two High
10" x 28" Single Stand Two High Rolling Mill
20 x 30 W-F Single Stand 2-High, Semi-automatic control. Complete with roll, spindles, feed, rolls, hydr. roll lift, lubrication system, guides, etc.
20½ x 30 Mesta Four Stand Two High
20 x 36" Single Stand Two High
20 x 60" Three Stand Two High
28 x 84 Nine Stand Two High
9" Two High Hot Mill for rolling strip steel
12" Four Stand Three High Merchant Type Mill
20" Mahoning Single Stand Three High

ROLLS—TAPER FORGING
#1 Ajax Taper Forging Roll, Motor Drive
#5 Ajax Taper Forging Roll, Motor Drive

PRESSES—HYDRAULIC
200 ton Hy-Matic Hydraulic Press, 36" Stroke 36" Between Uprights
300 ton HPM Hydraulic Press. Complete with Pump & Motor. Bed Area 30" x 36", Stroke 18", Daylight 24"
500 ton Hy-Matic Hydraulic Press 24" Stroke, 3'8" Between Uprights
1000 ton Chambersburg 4-Column Hydraulic Press, 18" Stroke, 48" x 22" Between Columns
1000 Ton United Steam Hydraulic Forging Press
1500 ton Wood Hydraulic Press, Complete with Pump & 75 H.P. Motor, 12" stroke, 48" x 48" Bed Area
1500 ton Birdsboro, Bed Area 30" x 72" Daylight 30"
2500 ton Bliss Hydro-Dynamic Press, Complete with Elecl. Equip. 40" Stroke, Bed Area 80" F to B x 40" R to L
3000 ton United Steam Hydraulic Forging Press. 162" Between Columns, 11'1" Daylight, 7'6" Press head travel with forging dies

PRESS—INCLINABLE
No. 298 Bliss Inclinable Press 6" Stroke, Bed Area 30" x 48" NEW

PRESS—KNUCKLE JOINT
#685 Toledo Knuckle Joint Press 800 ton Capacity, 4" Stroke 28" Between Uprights

PRESSES—STRAIGHT SIDE
800 TON FERRACUTE SINGLE ACTING
PRESS TRIPLE GEARED, TWIN DRIVE BY
MOTOR THRU V-BELT
BED AREA 112" RtoL x 75" FtoB
AIR OPERATED CLUTCH

No. 59 Toledo Single Crank Press 6" Stroke, Bed Area 39" x 40"
No. 89 Bliss Single Crank Press, 10" Stroke 345 Ton Capacity, Bed Area 33" x 33"
No. 675 Bliss Straight Side Press, 2½" Stroke, 37½" Between Uprights
No. K-1200-30 Clearing Press, 200 Ton Capacity 4" Stroke 31" Between Uprights
No. 58½ Toledo 300 Ton, 7" Stroke 31" Between Uprights
#16 Waterbury Farrel 255 Ton, 6" Stroke, 35" Between Uprights
No. 76½ Bliss Press 215 Ton, 4" Stroke, 27" Between Uprights
#267 Consolidated 255 Ton, 3" Stroke 35" Between Uprights
#168¼ Toledo 350 Ton, 8" Stroke 40" Between Uprights

SHEAR—ALLIGATOR
United Engrg. & Fdry Co. Alligator Shear. All Steel Motor Driven. Capacity 6½" Square
No. 1½ Doelger & Kirsten Alligator Shear. Low Knife. Right Hand, Wedge Type. Capacity 2" Round or Square soft steel

SHEAR—ANGLE
No. 7 Cleveland Angle Shear, Motor Drive, Capacity 8 x 8 x 1½" Angles. Independent Clutch Operation
Long & Allstatter Double Angle Shear. Capacity 6 x 6 x ¾"

SHEAR—BAR
United Engrg Co. Bar Shear, Motor Driven. Capacity 2½" Square

SHEAR—BILLET
No. 6 Mesta Billet Shear, Motor Driven, Capacity 6" x 6" Square Billets
Hilles & Jones Billet Shear, Arr. Motor Drive. Capacity 4" x 4"

SHEAR—GATE
8'3" Cincinnati Gate Shear, Motor Driven. Capacity 1" Plate, 24" Throat

72" x ½" Hilles & Jones No. 3 Gate Shear Motor Driven Incl. 20 HP AC Motor
10' x ¾" Williams & White Gate Shear, Motor Driven, 24" Gap. Complete with 30 H.P. Motor
10' Hilles & Jones #5 Gate Shear, Motor Drive, ⅝" Capacity, 36" Throat

SHEAR—SQUARING
7' x ⅜" Morgan Squaring Shear Guillotine Type 24" Gap. Arranged for Motor Drive
10' x ⅜" Niagara Squaring Shear, Motor Driven 20 H.P. A.C. Motor Included

SHEAR—ROTARY
No. 40A Quickwork Whiting Rotary Shear. Motor Drive 48" Throat, Capacity ½" Mild Steel
No. 250 Kling Rotary Shear, Arr. Motor Drive, 36" Throat Capacity ¼" Plate

SLITTERS
36" Lamb & Nash Gang Slitter, Belt Driven, Capacity No. 11 Gauge & Lighter
36" Yoder G-36 Sheet Slitter, Motor Driven, Capacity No. 10 gauge & Lighter
27" Gang Slitter, Motor Driven 3¾" Dia. Arbor, Including 42" Rewinder, Motor Driven

STRAIGHTENERS
No. 1 MEDART STRAIGHTENING MACHINE, Arr. for Motor Drive. CAPACITY ½" to 2½" ROUND BARS

¾" Shuster Straightening & Cut-Off Machine, Belted Motor Drive with 28' Cut-Off

TESTING MACHINES
20,000# Olsen Universal, Motor Driven
60,000# Riehle Universal Hydraulic
100,000# Riehle Universal Motor Driven
150,000# Riehle Universal Motor Driven
200,000# Elmes Compression Testing Machine, Hydraulic Type
800,000# Hydraulic Chain Testing Machine

WELDERS—SEAM
Berkeley Longitudinal Automatic Seam Welder. Complete with drive unit and nest rollers for both 6" Dia. & 10" Dia. Work
Hamilton Longitudinal Seam Welder. Complete with drive unit and nest rollers for both 6" & 10" Dia. Work

WIRE MACHINERY
No. 2 Vaughn Cone Type 5-Die Continuous Wire Drawing Machine. Capacity .085 to .045"
No. 2 Waterbury Farrel Coil Clutch Bench Four Blocks 16", Capacity 3/16" Stainless Steel, starting size
No. 1 Waterbury Farrel Coil Clutch Bench Five Blocks 16". Capacity 3/16" Stainless Steel, starting size
No. 0 Waterbury Farrel Lift Type Bench 14 Heads 8". Capacity 3/32" Soft Steel, Starting size

• Manufacturing **RITTERBUSH & COMPANY, INC.** Equipment •

50 CHURCH ST. NEW YORK CITY, 7
Telephone Cortlandt 7-3437-3438

Confidential Certified Appraisals
Liquidations—Bona Fide Auction Sales Arranged

Consulting Engineering Service
Surplus Mfg. Equipment Inventories Purchased

VALUES GALORE

Right On Our Floor

LATHES

1—Monarch EE 10" x 20" Sensitive Precision Toolmakers' Lathe, motor driven, sw. over bed 12½", dist. betw. cens. 20", taper attmt., used 6 mos.

1—Bradford 12" x 6' Lathe, New, 12 speed, timk. bear., grd. hed., motor in base, latest type.

1—Bridgeford 36" x 56'. 15 speed, grd. hed., Eng. Lathe, M.D. AC elect. equip. power rap. trav. to carr., compound rest, 2 steady rests, sw. 38" over bed, 26" over carr., dist. betw. cens. 48', mtzd. apron and taper attmts.

BORING MILLS

1—1-14' Sellers, Vert. Bor. Mill, 2 hds. on crossrail, stroke vert. slide in saddle 40" height under cross rail heds 9' 6 13/16", diam. largest swing to clear uprights 146", diam. tbl. 9', gr. box drive, rap. trav.

1—Bullard 60" Vert. Boring Mill, 2 heds. on cross rail, 40" clear under crossrail, tbl. 58" diam., vert. hed. trav. 24", arranged for M.D., AC elect. equip. removable chuck jaws, rap. travers, wght. appro. 17,000 lbs.

1—Bullard 36" "New Era Type" Vert. Bor. Mill, capac. 38" diam. 24" high, 25" under turret face, 4 jaw chuck, coolant. M.D. weight approx. 14,000 lbs.

PLANERS

1—Putnam 84" x 84" x 40' Dbl. Hous. Planer, Revers, M.D. and controls, 2 heds. on cross rail, 2 side heds., just taken out of service.

1—Woodward-Powell 48" x 48" x 14', 2 heds. on cr. rail, 2 side heds., reversible M.D., motor control complete, generator set.

MILLERS

1—Milwaukee #4H Vert. Miller, tbl. wkg. surf. 74" x 15½", feeds: long. 42", cross 14", vert. 16", motor driven, very latest type.

1—Van Norman #2SU Univ. Mill. Machine, hor. knee type, very latest type, tbl. wkg. surf. 50" x 12", feeds long. 24¼", cross 10", vert. 17", motor driven.

B. & S. #3A Univ. Mill. Machine, motor in base, tbl. overall 57½" x 13¼", feeds long. 34", cross 12", vert. 19".

1—Cin. No. 2MH Pl. Hor. (Late Type) Miller, 1200 RPM, tbl. wkg. surf. 49" x 10½", long-range 28", cross 10", vert. 19".

1—Cin. #4 High Power Vert. Miller, M.D. tbl. wkg. surf. 64½" x 16½"; long. range 42", cross 15", vert. 14". spdle. speeds 16, range 14 to 350 RPM, rapid traverse.

PRESSES

1—Farquhar 100 Ton Hyd. Press, daylight 48", stroke 36", approach and return speed 1600' per min., given maximum variation 5 degrees, wght. 44,000 lbs., elec. equip. 440/3/60, condition equal to new.

1—Toledo No. 666 Knuckle Jointed Embossing and Coining Press, capac. 1000 Ton, stroke 2", shut height 18", width betw. uprights 32", width between gibs 25", wght. approx. 90,000 lbs.

GRINDERS

1—Norton 12" x 36", Multi-Purpose Hydraulic Univ. Grinding Machine, max. hole diam. ground 11½", wheel guard capac'tv, 14" x 3", motor driven, very latest type, used very little.

1—P. & W. Vert. Hydraulic Surf. Grinder, Type M-1640, chuck 14" x 60", motor driven, 30 HP on spin. segment chuck wheel, very latest type, equiv. to new.

1—B. & S. #2 Univ. Grinder, capac. 14" diam. x 30" length, very latest type.

1—Cin. 12" x 48" Hyd. Univ. Grinder, comp. with univ. equip., very latest type.

SHAPERS

Stockbridge 24, motor driven, Crank Shaper, single pulley driven, stroke 24¾", vert. trav. of tbl. 15", hor. tbl. trav. 30".

1—American 16" Crank Shaper, M.D. stroke 16¾", hor. trav. of tbl. 24", vert. trav. of tbl. 11⅞".

HAMMERS

1—United 3000 lb. board drop type.

MISCELLANEOUS

1—National Mach. Co. 3" Upsetter, steel frame: die box depth 15", width 16½", dist. from face plate to back of heading tool 43⅛", approx. net weight 62,000 lbs.

Are you thoroughly familiar with the complete Botwinik Story? You will find many worthy suggestions in our complete 24-page catalog. A copy is waiting for you. Write, wire, or phone.

Botwinik Brothers of Mass., Inc.

5 SHERMAN ST. • WORCESTER 1, MASS.

Newton Cold Saw 32"
Capacity 12" diameters
2 Motors Variable Speeds, Q. C.
3/60/220-440. Feed Table
Wt. 8500 lbs. Latest Model

KINGS COUNTY MACHINERY EXCHANGE

408 Atlantic Ave., Brooklyn 17, N. Y.
PHONES: TRiangle 5-5237, 5-5212, 5-5213
WIRE! PHONE! WRITE!

FOR SALE

One Ingersoll-Rand Well Drill Bit Sharpener for sharpening 6 inch to 6¾ inch bits. Type I-R 9-D. Serial #8075. Including I-R Hot Miller.

One Ingersoll-Rand Kackhamer Steel Sharpener. Type I-R 50 144.

All machines used. Fair condition.

For further information apply to

FRACKVILLE SHOPS COMPANY
Frackville, Pa. Phone 148

AUTOMATICS

2⅝" Acme Gridley 6 spdl., RA6
2" Cleveland model B, 18" feed
1 1/16" Cleveland 4 spdl., model M
⅞" & 1¼" Cone 4 spindle
No. 454 New Britain chucking
12"x63", 14"x19" & 16"x33" Fay
1" Economy shaver or turner
14"x19" Monarch Magnamatic lathes
6", 8", 10" & 15" Sundstrand auto. stub

BORING MILLS

3⅛", No. 0 Giddings & Lewis
3½" Universal
4¾", No. 300 Giddings & Lewis floor type
7" Barrett cylinder
24" & 36" Bullard vertical
53" Niles Bement Pond
96" Cincinnati Massive
100 Niles Bement Pond Heavy

BROACHES

No. 1 Foote Burt duplex surface
9 ton American horiz. hydr. surface
Twin 10 & 3XA Oilgear
Nos. 2S & 3H LaPointe
30 ton No. V48 American vertical
No. 2 Standard screw press

GEAR MACHINERY

Nos. 3, 12 & Type D Barber Colman
Nos. 8H, 12H & 16HS Gould & Eberhardt
Nos. 1, 5A & 5AC Lees Bradner
No. 130 Cleveland Rigidhobber
Nos. 7 & 61 Fellows gear shapers
Gleason bevel cutters, testers, etc.

GRINDERS

6"x18" & 10"x72" Norton hydraulic
4"x12", 6"x18", 10"x18" & 14"x36" Landis hydraulic
10"x18" Cincinnati hydraulic
No. 2 Cincinnati centerless
14"x60" Mattison hydr. surface
12"x48" Thompson hydr. surface
10"x24" Norton hydraulic surface
No. 115 Gardner opposed disc
30", No. 86 Gardner horiz. disc
12", 16" & 24" Heald rotary surface
16" & 26" Blanchard rotary surface
14"x36" Pratt & Whitney vert. surface
Nos. 32 & 42 Van Norman radius
Nos. 72A3, 72A5 & 75A Heald internal

LATHES

14"x6' Lodge & Shipley
14"x6' Mulliner
14"x8' Hendey
15"x6' Porter McLeod
25"x48" ctrs. LeBlond, late type
24"x96" ctrs. Monarch
36"x16' Bridgeford

LATHES, TURRET

Nos. 2, 3, 4 & 5 Warner & Swasey ram type
Nos. 1A & 3A Warner & Swasey saddle type
Nos. 3, 4 & 5 Gisholt ram type
Nos. 1L & 3AL Gisholt saddle type
3½", No. 2 Cincinnati Acme saddle type
No. 5 Foster
No. 5 Bardons & Oliver
1½", No. 601 Oster
Nos. 2G & 3 Morey
3"x36" & 4"x34" Jones & Lamson
24" & 36" Bullard vertical

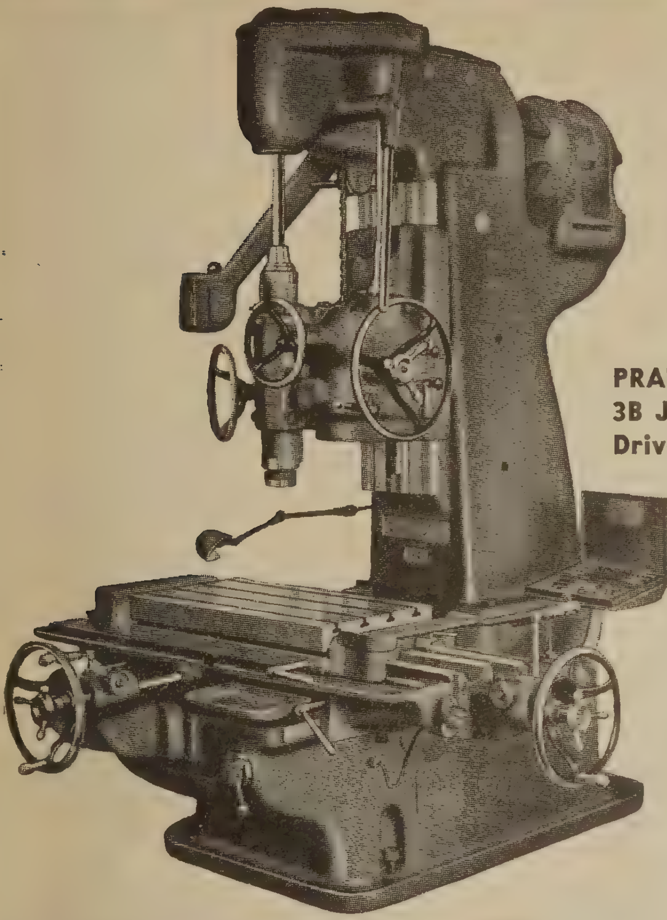
MILLERS

Nos. 2AS, 3B & 4B Milwaukee
No. 3 Cincinnati universal
No. 3 Van Norman duplex
Nos. 3 & 4 Cincinnati dial
Nos. 2H, 3H & 4H K & T vertical
Nos. 2, 2M, 3 & 4 Cint. vert.
Nos. 2-24, 3-24, 4-36, 5-48 Cincinnati Hydromatic
Nos. 1, 2 & 2RV Kent Owens hand
No. 1MM-60 U.S. Multimillers
No. 12 Brown & Sharpe
12" Cincinnati plain mfg.
18" Cintl., plain & duplex
30", 42" & 84" Ingersoll rotary
Type CT36 Lees Bradner thread
No. 3 Planomil thread
4" Pratt & Whitney spline

MILES MACHINERY CO.

SAGINAW, MICH.

LATEST TYPE NEARLY NEW MACHINES



PRATT & WHITNEY 3B Jig Borer Motor Drive, Latest Type

BORING MILLS—Horizontal

DETRICK & HARVEY 4", 5" bar, Floor Type
GIDDINGS & LEWIS #32—3⅛" bar, M.D.
LANDIS #35, 3½" bar, Floor Type
LUCAS #31 3" bar, M.D.
MORTON 60" traveling hd., combination borer, miller and driller, M.D.
NILES BEMENT POND 4½" bar, Motor Drive
NILES BEMENT POND 5", 6", 7" bar, floor type, M.D.
UNIVERSAL 3" bar, latest type

BORING MILLS—Vertical

BETTS 120", 2 swivel heads, AC, M.D.
BETTS (Consolidated) 84"—3 heads, AC, Latest
BULLARD 16"—6 spindle Mult-Au-Matic—Type D—Single indexing—Latest Type
BULLARD 24", 36" vertical turret, New Era Type, M.D.
BULLARD 24", 36" Ver. Turret, Spiral Drive, latest
KING 36" Vertical Turret, M.D., Latest Type
NILES 62", 73", 100", swivel heads—PRT, Motor Drive

BROACHES

LaPOINTE #4L, Horiz., hyd., latest type
LaPOINTE #SRV-25-66, 10-54, Vertical Surface, hyd., latest type

DRILLS

BAUSH #3, 4—Adjustable Multiple Spindle—M.D.
CARLTON 6'15", plain radial, M.D.
NATCO D5, D6 Adj., mult. spdle, latest type
FOSDICK 6' arm 19" column Economax, Hyd. Radial, latest type
WESTERN 5'18", 6'20" Radial—Latest Type

GEAR CUTTING EQUIPMENT

BARBER COLMAN #3 Hobber, Latest Type
BARBER COLMAN #3 Hob Sharpener, Latest Type
BROWN & SHARPE No. 3H gear cutter, M.D.
CROSS #73 univ. Chamferer, Latest Type
FELLOWS 61 #64, 615A, 645A3, 7, 7A, 72, 75A, 77, High Speed Gear Shapers, latest type
GOULD & EBERHARDT 12H, 24H, 36H, 48H Hobber, latest type
GLEASON #7 Hypoid, Zerol, Spiral Bevel Generator, latest type
GLEASON #16 Hypoid, Spiral Bevel, Formate Generator, latest type
GLEASON 36" str. bevel gear planer, M.D.
GLEASON 11", 18" bevel generator, M.D.
GLEASON 12" Straight Bevel Generator, Latest Type
GOULD & EBERHARDT 12HS Hobber, latest
PRATT & WHITNEY 10" Grinder, hyd., latest
SCHUHARDT & SCHUTTE #1, #2 with diff., M.D.

GRINDERS—Cyl.—Plain & Univ.

BROWN & SHARPE #1, 2, 3, 4, Universal, Latest
BROWN & SHARPE #5 Plain, 3x12, Latest Type
BROWN & SHARPE #20, 10x18 plain, 1 test type
CINCINNATI 6x18 plain Model EA, hyd., latest type
LANDIS 4x18, Type H, hyd., latest type
LANDIS 6x18, 10x18, Type "C", Hyd., Latest
LANDIS 30x220" Plain, Roll, Motor Drive
NORTON 16x72" Univ., Hyd., Type C, latest
NORTON 16x72" Plain Type "C", latest type

GRINDERS—Surface

ARTER 30" Rotary Surface—Hyd.—latest type
BLANCHARD #11—16" chuck, Latest Type
BLANCHARD #16—24" chuck, Motor Drive
BLANCHARD No. 16A—Dial Type—motor drive
BLANCHARD #27-18 M.D., Latest Type
GALLMEYER & LIVINGSTON #35, 8x24" Hyd., latest
GALLMEYER & LIVINGSTON #55, 12x36" hyd., latest
HANCHETT Series 300—12x48 hydl., vert. spdl., latest
HEALD #22, 12" chuck, Rotary, latest type
HEALD #25A Rotary 16" chuck Hydraulic, latest type
MATTISON 12x14x60 Hydraulic, latest type
MATTISON 14x16x60 Hydraulic, latest type
MATTISON 20x24x72 Hydraulic, latest type
NORTON 6"x18"—Hyd.—Latest Type
NORTON 10x36 Hyd., Latest Type
THOMPSON 8x12x24 Hyd., latest type
THOMPSON 16x30x48 Hyd., Latest Type

JIG BORER

PRATT & WHITNEY 3B, Motor Drive, Latest

LATHES—Engine and Mfg.

BETTS BRIDGEFORD 60"x24' bed, swing 84"
BRIDGEFORD 36"x28' 36"x32' bed—2 car., M.D.
HENDEY 14x8' geared, Engine, M.D.
JONES & LAMSON "Fay" 20x25" automatic, TIMKEN, latest type
LEBLOND 17"x5', 30"x10' bed, Rapid Production, Timken Bearing, latest type
LEHMAN 16x30, hydratrol, Timken, latest type
LOSWING 4x60, 4x84, 8x60, 8x108, 5x34" centers, latest
MONARCH 10x20" centers, Model EE Timken, latest
MONARCH 16x28" centers, geared hd., M.D.
MONARCH 36x108" Centers, Timken, latest type
MONACH 12"x30" centers, Timken, Latest Type
NILES 42"x60", double head, motor drive
NILES 48x35' centers, Heavy Duty, 2 carriage, Timken Bearing, PRT, Latest Type
NILES 48x32' centers, 2 carriages, MD
NILES 48x63' centers, Combination Boring & Turning, MD
NILES 48x87' centers, Combination Boring & Turning, MD
NILES 60x10', 35', centers, 1 or 2 carriages, Timken Bearing, PRT, Latest Type
NILES 72"x62', centers, combination Boring and Turning, Motor Drive
NILES 30x50' Boring, Timken, Latest Type
REED PRENTICE 16x24" centers, geared hd., M.D.
SPRINGFIELD 16x43" centers, geared hd., M.D.
SPRINGFIELD 16x24" centers, geared hd., M.D.
SUNDSTRAND 8x15", 12x22" stub, automatic, TIMKEN, latest type
WARD HAGGAS & SMITH 18/36"x10' bed, Gap

LATHES—Turret

CINCINNATI ACME No. 1, No. 5W, Latest
GISHOLT #3, 5, Univ., Timken, Latest
GISHOLT #1L, #2L, Universal, Timken, Latest Type
JONES & LAMSON #3, 7C, 8A, Universal, Timken Bearing, Latest Type
LIBBY 1H-5, 5½ hole, Timken, Latest
MOREY No. 2G, No. 3, No. 4, Timken, latest
POTTER & JOHNSTON #5D2E, 5DE, TIMKEN, latest
WARNER & SWASEY 3A, Universal 6" bar capacity, Timken Bearing, Latest Type
WARNER & SWASEY #5, Univ., Timken Bearing
WARNER & SWASEY #1A, 4A, Univ., Latest Type

MILLING MACHINES—Mfg.

CINCINNATI 3-24 Duplex Hydromatic, latest type
CINCINNATI 24", 48" duplex, TIMKEN, M.D.
INGERSOLL 32x24x16' Planer Type, 2 heads, AC, M.D.
TAYLOR & FENN M-80 Duplex, Spline, latest type

MILLING MACHINES—Plain

BROWN & SHARPE #3B Timken, latest
BROWN & SHARPE #12 Timken Bearing, latest
CINCINNATI #4 Timken Bearing
CINCINNATI #4S, #5, motor drive
CINCINNATI 1-12, Timken, latest type
CINCINNATI 4-36 Hydromatic, latest type
CINCINNATI #2, 4-Dial Type, Timken, latest
CINCINNATI 0-8 Automatic rise and fall, Timken, Latest Type
KEARNEY & TRECKER #2K Timken, latest type
KEARNEY & TRECKER #4 heavy, Timken, latest
KEARNEY & TRECKER 1218, 1224, simplex, TIMKEN, latest type
KEMPSMITH #2, #4 Maxi-Mill, Timken, latest

MILLING MACHINES—Vertical

CINCINNATI No 3, No. 4 High-Powered, M.D.
CINCINNATI #2, 3, 4, Dial Type, Timken, latest type
GORTON 8D high speed with duplicator, latest type
GORTON 9J superspeed, with duplicator complete, latest type
REED PRENTICE #5 die sinker, latest type
REED PRENTICE 3VG with Hydraulic Duplicator, Timken Bearing, latest type

PLANERS

CHANDLER 36x36x20', 4 heads, AC, M.D.
DETRICK & HARVEY 48x48x16', 4 heads, Hyd.
DETRICK & HARVEY 84x84x18', 4 heads, DC, M.D.
NILES BEMENT POND 48x48x16', 2 heads, AC, M.D.
OHIO 42x42x20'—2 heads, AC, M.D.

SHAPERS

LAMAIRE 18' Vert. Hydraulic—latest type
LYND FARQUHAR 26" Openside, Motor Drive
MOREY 8", 10", 12", 14" Vertical, latest type
MORTON 48" Draw Cut, Motor Drive
PRATT & WHITNEY 6' 10" Vertical, M.D.

MISCELLANEOUS

BARNES #172, 306H Vertical Hone, Latest Type
BILLINGS & SPENCER 1500 pound drop hammer
BIRDSBORO 325 ton vertical hyd. press, latest type
FERRACUTE DG-55, 75 ton Drawing Press, Tie Rod, 17" stroke, Latest Type
JONES & LAMSON 6x15", 8x48" thread grinder, latest type
LANDIS 1" Bolt Threader—Latest Type
MORTON 60" combination traveling hd., planer, miller and borer, M.D.
PRATT & WHITNEY "Keller" Type G, Type BL2416—Latest Type

Available for Prompt Shipment ***Most Built After 1941***

(Partial List) Over 2,000 Machine Tools in Stock. Your Inquiries Are Invited . . . Prompt Service is Assured

MOREY MACHINERY CO., INC.
410 BROOME ST., NEW YORK 13, N. Y.
TELEPHONE: CANAL 6-5360
CABLE ADDRESS: WOODWORK, N. Y.

QUALITY *Machine Tools*

NOW IN STOCK

28″ x 60″ Cincinnati Hydrotel Vertical Milling Machine, single spindle model with 360° profiling attachment, motors and controls. New in 1941.

AUTOMATICS

9/16″ RA-6 Acme-Gridley. New in 1943.
1″ RA-6 Acme-Gridley. New in 1943.
1¼″ R-6 Acme Gridley.
1⅝″—8 spindle Conomatic. New in 1942.
5½″ Cleveland Model A, single spindle.
16″ x 33″ Fay Automatic Lathe. New '41.
★ **Bullard Multaumatic, six spindle model D, single index. Late model.**

BROACHES

No. 2SL LaPointe Hydraulic Horiz. 1942.
No. CPC 8-24 LaPointe Hyd. vert. 1943.
No. CPC 6-36 LaPointe Hyd. vert. 1943.

DRILLS

6 Ft. American radial 17″ column.
4′-9″ Cincinnati-Bickford Radial. New in 1945.
★ **No. 26HO Baker Hydraulic, S. S., 3″ capacity in steel, with motor & control.**
42″ Cincinnati-Bickford, single spindle.
No. 3 Avey, three spindle, heavy duty.
No. 3 Baush Multiple Spindle.
Barnes Horiz. Deep Hole, two spindle.
Taft Peirce Horizontal, double end.

GEAR CUTTERS

No. 16H Gould & Eberhardt Universal Hobber. Latest type.
No. 7A, 7125A Fellows Gear Shapers.
No. 615A, 645A, Fellows Gear Shapers.
No. 3, 12 Barber Colman Hobbers.

GRINDERS

No. 2 & No. 3 Cincinnati Centerless, Filmatic spindle. New in 1941.
14″ x 48″ Cinci. Plain, Filmatic spindle.
10″ x 36″ Landis Hydraulic. New '43.
6″ x 18″ Cinci. Hyd., Filmatic spndl. 1943.
No. 3 Brown & Sharpe Universal. 1943.
No. 13 Brown & Sharpe Univ. and Tool.
No. 2 Norton Universal Tool.
No. 18 Blanchard, 30″ chuck. New 1942.
14″ x 16″ x 60″ Mattison Surface.
No. 75A Heald Internal. New in 1943.
No. 72-A-3 Heald Sizematic. New in 1943.
No. 16-16 Bryant Internal, Hydraulic. Used less than 2 years.

LATHES, ENGINE

Monarch Toolmakers 10″ x 20″ Model EE.
Lodge & Shipley 20″ x 48″. New in 1943.
★ **Bertram 28″ x 240″ "Timesaver", two carriages, rapid traverse. Canadian made from Niles patterns. New in 1942.**
Lodge & Shipley 48″ x 54″, cone driven.
Carroll Jamieson 18″ x 5′, C.D.
LO-Swing, IMP & LR.
South Bend 14½″ x 6′, c.d.
Lipe Carbomatic, 15″ x 30″.
LeBlonde Production, 17″ x 30″.

LATHES, TURRET

Warner & Swasey No. 2A, preselector. New in 1943.
Warner & Swasey No. 1A, preselector. New in 1940.
Gisholt No. 1L, Hyd. speed selector. 1943.
Warner & Swasey No. 5 Universal. 1943.
Gisholt No. 5 Universal, Hydraulic speed selector. New in 1944.
Foster No. 5 Universal, Bar feed. 1943.
Warner & Swasey No. 4 Universal, preselector. New in 1943.
Gisholt No. 4 Universal, Hydraulic speed selector.
Warner & Swasey No. 3 Universal, two speed. New in 1942.
Bardons & Oliver No. 3 Universal, motor in base. New in 1941.
Warner & Swasey No. 2, oversize. 1942.
Bardons & Oliver No. 2, bar feed. 1941.
Brown & Sharpe No. 1, m. in base, 1941.
★ **Bullard New Era VTL, 36″ x 42″.**

MILLS

Van Norman No. 2SU Universal.
Gorton No. DJ Vertical, with tracer.
Cincinnati No. 2MH Plain, latest model.
Cincinnati Vertical, No. 3, Med. S. Dial.
Milwaukee Vertical, No. 2H. New in 1942.
★ **72 Betts Vertical Boring Mill, two heads, DC driver with AC/DC generator. New in 1943.**

MISCELLANEOUS

No. 5B Standard OBI Press. New.
No. 7 Kling Punch, 1¼″ through 1″, 72″ throat.
No. 8-6 Zeh & Hahneman S.S. Geared Press.
Pratt & Whitney Profiler, No. 12D.
25″ Gleason Quenching Press.
24″ Cincinnati Worm Feed Rotary Table.

PLANERS AND SHAPERS

Cincinnati Planer, 42 x 42 x 20, D.C.
Cincinnati 24″ Shaper, Univ. table. 1945.
American 24″ Shaper.
Gould & Eberhardt 24″ Shaper.
Cochrane & Bly No. 14 Vertical Shaper.
Pratt & Whitney 6″ Vertical Shaper.

ALL MACHINES MAY BE INSPECTED UNDER POWER IN OUR WAREHOUSE

INDIANAPOLIS
MACHINERY & SUPPLY CO., INC.
1959 S. Meridian St., Indianapolis 6, Indiana
EASTERN BRANCH: 44 WHITEHALL ST., NEW YORK
MEXICO OFFICE: HIDALGO ORIENTE 2-335-B, MEXICO, D.F.

OIL EXTRACTOR

#401-E Barrett Oil Extractor, Motor Driven.

Settling Tank with pump.

55 Gallon Sterilizer with steam coil.

Manual operation, thermostatically controlled.

275 Gallon Storage Tank.

NEW 1943

DELTA EQUIPMENT CO.
148 N. 3d St. Phila. 6, Pa.

Columbia all steel gap Shears (New)
12′ x 3/16″ x 18″ gap 10′ x 3/16″ x 18″ gap 6′ x ¼″ x 18″ gap
Columbia all steel Power Press Brakes (New)
10′ x 3/16″ 8′ x ¼″ 6′ x ¼″
Double Crank Presses (New)
100, 150, 200, 250, 300 tons
O. B. I. Presses (New) Flywheel, Geared
(4) Bliss 78½ 350 Tons 18″ Stroke, 44″ shut height, bed 36″ x 36″, Bolster 24″ thick. Pneumatic Cushions in Bed. Friction clutch air operated, motorized.
(3) Bliss #304 55 Tons 9″ stroke, adjustment 2½″, shut height 12″, bed area 17″ x 17″, motorized.
(4) Bliss #6 Triple Crank Drawing Presses
Strokes blank holder 2″, drawing slide 5″, adjustments blank holder slide 1″, drawing slide 2″, shut height blank holder 13″, drawing slide 16″. Blank holder (cutting slide) 80 tons, drawing slide 55 tons, bolster area 24″ x 31″. Roll feed and scrap cutting attachments, motorized.

EDWARD FRANKLIN
SCHILL CORPORATION
39 Cortlandt St., New York 7
Worth 2-2473 • Worth 2-0232

MDNA

Immediate Delivery

BORING MILLS

Pratt & Whitney #2A Jig Borer, New 1945
No. 0 Giddings & Lewis, M.D.
2″, 4″ Binsee
2½″ Cleveland, M.D.
54″ Colburn, M.D., 2 heads
Niles-Bement-Pond 4″ duplex
Universal 3″
24″, 42″ Bullard New Era Vertical

TURRET LATHES

No. 1L, 2L, Gisholt Universal, M.D.
Foster Nos. 4, 5, 6, 1B, 3B, M.D., Univ.
J. & L. 2¼″ x 24″, 3¼″ x 36″, No. 3 Dial
Acme, 3¼″, M.D.
W. & S. Nos. 3, 4, Preselector, M.D., 2A

GRINDERS

Grenby 1-2 Int.
Covel No. 91A Tool & Cutter (1941)
Norton 6 x 18″, 8 x 24″ Hyd. Surface, M.D., Late
Heald No. 25A Rotary Surf. Like New
No. 25 G. & L., M.D. 6 x 18 Hyd. Surf.
No. 2 Cincinnati Centerless, M.D.
P. & W. 14″, B.B., Vert. 19 x 49
Blanchard 30″, M.D.; Modern 12 x 48″, M.D.
Norton Hydraulic, 12″ x 18″, M.D.
Heald No. 72A3 Gagematic
Norton 50″ x 28″ Roll Grinder
Landis 6 x 20″, Hydraulic, M.D.
Bryant No. 12, M.D.
Nos. 50, 55, 60, 65 Heald Int., M.D.
B. & S. Nos. 1, 3, Univ.
B. & S. Nos. 10, 11, S.P.D.
12″ Heald Rotary, M.D., 12″ Arter
B. & S. and Nos. 2, 2B Surface, M.D.
Abrasive #34 Vert. Surf., 3B, 8″ x 24″
DOall Surface Grinder, 8 x 24″ with Selectron

LATHES

South Bend 16″ x 10′, M.D., Hendey 16″ x 8′
Monarch Grd. Hd., 10 x 20″, 12 x 30″
P. & W. 1 x 18 Automatic, 9″ LeBlond Prod.
Hendey, 12″ x 30″, Grd. Hd., 14″ x 6′
36″ x 30′ Putnam, M.D., 42″ x 10′, G.H.
36″ x 20′ Putnam, S.C.G., D.C., M.D.
32″ x 35′ Wickes Grd. Hd.
Boye & Emmes 20 x 30′ Grd. Hd., M.D., 28″ x 12′

AUTOMATICS

Cleveland Model A, 1½″, ⅜″, 1¼″, 2″
Cleveland Model B, 1″, 2″
⅞″ Cone 4 Spindle Gridley
P. & I. 6A, M.D.
No. 0G Brown & Sharpe M.D.
No. 2 Brown & Sharpe Hand Screw

NEW IN STOCK

Power Shears—52″, 72″ & 96″
5, 7, 10, 14, 18, 30 ton O.B.I. Power Presses
7″ Ammco Shapers
8″ Shape-Rite Shapers
#1½ Abrasive Surface Grinder
Halco H.S., Vertical Heads, Drill Presses
Kalamazoo Metal Band Saws
Spot & Arc Welders
6 x 6″ Racine Hacksaws, Hyd.
20 ton Northern Hyd. Presses
Marvel #8 Band Saw

RADIALS

4′, 5′, 6′ American Triple Purpose
6′ Cincinnati-Bickford
3½′ Mueller, M.D.; 4′, 5′ Western, S.P.D.
4′ Fosdick, Motor on Arm
Carlton 8′, 19″ col., motor on arm

MILLING MACHINES

Cincinnati No. 3, Rect. Overarm
B. & S. dial type Verticals, Swivel Head
Nichols Hand Miller, Burke Bench
#12 Van Norman, duplex head
#3 Cinn. Rech. Overarm
10″ P. & W. Automatic
No. 3S Cincinnati S.P.D., rapid traverse
Nos. 0Y, 3, 4, 5, B. & S. Plain and Univ.
B. & S. No. 12, Elec. Prod., 13
Hall Planetary Model D Thread Miller
Becker Nos. 3, AB, 5, 6, Vert.
Nos. 3, 4 Cincinnati Vert., 2
P. & W. No. 12, 30″ Profiler, M.D.
K. & T. B. & S. Nos. 2, 3
B. & S. No. 3 Vert.
Gorton 8D, 9J, Vert., M.D., Duplicator
No. 2A Brown & Sharpe Univ.
No. 1 Cleveland Vert. & Univ.
No. 2B K. & T. Univ.

MISCELLANEOUS

Cincinnati 8′ Press Brake ⅜″ cap., M.D.
Clearing 10′ Press Brake, M.D.
No. 0 Buffalo Angle Roll, M.D.
Deckel G1, G2 engraving machs.
Gorton Engraving Machines 3Z, 1A, 1D
6 spindle Avey Drill, 15″ overhang
Rochester No. 5½B Hammer
P. & W. 6″ Vert. Shaper
N.B.P. 15″ Slotter, M.D.
Lennex throatless shear, ¼″ capacity, M.D.
#20 Bliss O.B.I. Press, #4 Blackwheel
Bliss No. 58 O.B. Gap Presses
Marvel #6A Hacksaw, M.D., Auto. Feed
McKenzie Chin Separator National
Landis Dbl. Head Belt Threader

HYDRAULIC PRESSES

Write for free illustrated catalog.

AARON MACHINERY CO., Inc.
45 Crosby St. New York 12, N. Y.
DIGBY 9-1766

See SIMMONS for the Heavy TOOLS

LATHES

30" x 12' Boye Emmes G H
30" x 18' American G H
36" x 28' Lodge & Shipley
60" x 15' centers NILES, G H
100" x 32' N.B.P. extra heavy

RADIAL DRILLS

3½' Cincinnati Bickford
6' American, triple purpose
7' Carlton, motor on arm
8' American, motor on arm

MILLERS

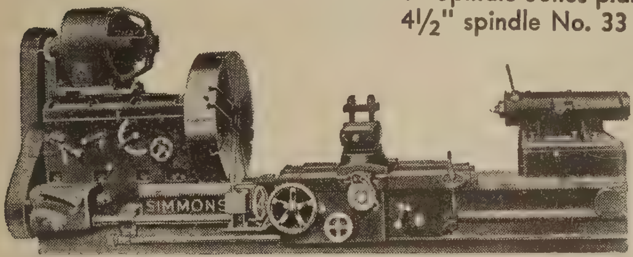
No. 5 Cincinnati Plain
4-B Milwaukee, double arm
3-A B & S Universal
1-B Milwaukee Universal
24" x 24" x 16' Planer Type

BORING MILLS

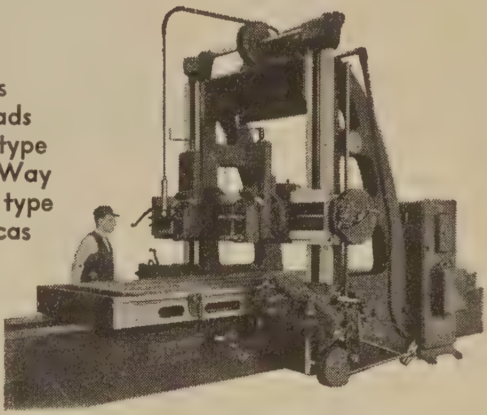
24" & 36" New Era
84" Cincinnati, 2 heads
12' N. B. P. 2 swivel heads
16-24' Niles extension type
3" spindle Universal Tri-Way
6" Spindle Jones planer type
4½" spindle No. 33 Lucas

GEAR HOBBERS

150" Muir gear Hobber
100" G & E gear Hobber
84-H Gould & Eberhardt
No. 44 Muir Hobber



48" x 40' Simmons Heavy Screw Cutting Engine Lathe, geared head for A.C. or D.C. Motor Drive.



10' x 10' x 20' N.B.P. Heavy, 4-heads, P.R.T., 230-V. D.C. reversing planer motor and pendent Push Button control station. Forced feed lubrication.

Write today for Complete Current Stock List of Simmons *Engineered-Rebuilt* Machine Tools

ENGINEERED *Machine Tool* REBUILDING

SIMMONS MACHINE TOOL CORPORATION

MAIN OFFICE AND PLANT: 1721 N. BROADWAY, ALBANY 1, N. Y. NEW YORK OFFICE: 50 EAST 42ND STREET

THE TOOLS YOU WANT—*BUT RARELY FIND*

VERT. & HOR. BORING MILLS

62" King, 2 hds., P.R.T., M.D.
53" N.B.P. 2 hd., P.R.T.
52" Gisholt, P.R.T., M.D.
42" King P.R.T., M.D.,
42" King, 3 heads

36" Bullard Spiral Dr. Lub., 3-jaw, 1943, Extra High
36" Bullard Spiral Dr. Lub., 4-jaw, 1942

36" Bullard New Era, 4-jaw
30" Colburn, 1 turret head, M.D.
8" Bar, N.B.P. Floor type

6" Bar G & L No. 560F Floor, 1943
6" Bar G & L No. 360 F Floor, 1942

5" Bar Sellers Table type 5' Vert. x 10' Horiz. travel, 1943
4" bar Chisholm-Ryder table type, 1942 30" Vert. & 86" horiz. travel

LATHES

14" x 8' Hendey, T.A., M.D.
16" x 8' L. & S., M.D.
16" x 10' Sidney, Motor in Base
18/36" Fay-Scott Gap, Quck, M.D.

22" x 96" centers Monarch, 24½" swing, P.R.T., Pan Coolant, New 1943-1944

21" x 10' Bed LeBlond, 26" swing
24" x 12' Springfield, T.A. Late
24" x 20' centers Amer., 1942, 2 carrs.
30" x 12' Bed LeBlond, T.A., M.D.
36" x 20' Bed L. & S. Grd. Hd.
36" x 23' centers N.B.P., 2 carr., 1942
42" x 17' centers Niles, T.A., 1942, 2 carr.
48" x 16' centers Niles T.A., 1943
48" x 25' centers Simmons, 2 carr.
60" x 15' centers N.B.P., 1943
60" x 27' centers N.B.P. Grd. Hd., M.D.
#16 LeBlond Auto. Production, 1942

TURRETS & AUTOMATICS

No. 1 L, Gisholt, Bar & Chuck
Nos. 5 & 3 W. & S. Univ., late
No. 4 W. & S. univ., new 1943
1½" Oster #601, Wire Feed
No. 1 B. & S. Screw Mach., new 1945 (3)
No. OOG, B. & S. Auto (2) (1942
No. 6DREL Potter & Johnston, 1941

RADIAL DRILLS

6' Fosdick 19" Col., 1943

42" Baush Radial Tapper, ½" capty. 1941
4 Spin., Leland-Gifford, #2 LMS, 1943
3 Spin., Leland-Gifford # 1 LMS
2B-8 Edlund 8", 1 Spin. (2) 1942

MILLING MACHINES

No. 4 Cinci. & K. & T. Hi Sp Horiz.
#2 H K & T Horiz. Pl.
#2 Cinci. Rech. Arm Horiz. Pl.
#3 Cinci. Vert. Hi-Speed, 1941
No. 2 MH Cinci. Univ., 1945
#2 H Milwaukee Universal, 1945, Vert. & slot. attach., Rotary Table
1848 K & T Simplex, 1944
4" Rice Barton Spline, 1942 (2)
2-18 Cinci. Automatic (4)
1—18 Cinci. Automatic 1943
1-M Kent-Owens, Hand
No. 2 Van Norman Duplex
12" x 102" Lees-Bradner Thread Miller

GRINDERS

24" x 240" Norton Cyl., M.D.
20" x 96" Landis Pl. Cylindrical
60" P. & W. Vert. Surface, 1942
17" x 28"-40" Norton Crankpin Dbl. Hd.
10" x 24" Landis Univ., Hyd., 1942
12" x 16" x 36" Mattison Surface
6" x 18" Norton Type C Hyd., 1943
#72A5 Heald Plain Internal, 1943 (8)
#72A3 Heald Sizematic, 1942 (3)
8" x 48" J & L Thread, 1941
#11 Blanchard, 16" chuck, 1940
No. 2 Kent Surface
#2 Cincinnati Centerless, 1943
Nos. 35 & 31 Excellos (2)

PRESSES, PUNCHES & SHEAR

Squaring Shear, 10' x ⅜" L. & N.
Multi Punch, No. 7 H. & J. 14" throat
56 ton Diamond Grd. O.B.I., new, M.D.
55 ton Diamond Fly. O.B.I., new, M.D.
30 ton Diamond Fly, O.B.I., new, M.D.
72" Clev., S.E. Punch, 1¼" x 1"
36" x 16 Ga. Niagara, 18" Gap

MISCELLANEOUS

Crane, 32', 5 ton, AC
GEAR HOBBER, 36 HS Gould & Eberhardt

1—#48H G. & E. Gear Hobber, Late
2—12" Gleason Str. Generators, 1942

BOLT THREADERS, 1" and 1½" Landis
GEAR SHAPERS, Nos. 712 & 75 Fellows
HAMMERS #4B & 4-1, Nazels, M.D.
HAMMERS #2B Lobdell-Nazel, 1943
KEYSEATER No. O Baker M.D.
SAW, Wells Metal Band
SAW, 10" x 10" Racine, 1944
SAW 6" RACINE Oil-cut, 14' Feed Rack
SHAPERS, 16" G. & E. M.D. (2)
SHAPER, 24" Milwaukee Motorized

CABLE ADDRESS—
Benmachine, New York

BENNETT MACHINERY CO.,

30 CHURCH ST.
NEW YORK 7, N.Y.

ReMANUFACTURED
-(ORIGINATED BY US)-
MACHINE TOOLS

LATHES

8"x15" Sundstrand, Model D
10"x22" Sundstrand, Model AA
12"x18" Lipe Carbo, Motor Drive
12"x5' Sebastian
14"x6' Hendey
18"x6' American Grd. Hd.
20"x25" Fay Automatics
20"x10' Lodge & Shipley
22"x48" Monarch (1942)
36"x30' Lodge & Shipley
50"x17' cc LeBlond Geared Head

MILLING MACHINES

No. 2H Milwaukee Vert. (1942)
No. 2 Cincinnati Vert. (1942)
No. 2M Cincinnati Vert. (1941)
No. 3 Milwaukee Vert.
No. 3 Cincinnati High Power Vert.
No. 3K Milwaukee Vertical (1942)
No. 2-18 Cincinnati Rise & Fall (1941)
No. 4-48 Cinn. Plain Hydromatic (1942)
No. 5-48 Cinn. Plain Hydromatic (1942)
No. 45-48 Cinn. Duplex Hydromatic, Tracer Control
No. 56-90 Cinn. Plain Hydromatic
24" Cincinnati Production
No. 2 Hanson-Whitney Thread Miller
4"x9" Hanson-Whitney Thread Miller
6"x20" Pratt & Whitney, Model C
6"x36" Lees-Bradner Thread Miller
4" Taylor & Fenn Spline Miller
24"x24"x12' Ingersoll Adj. Rail
54"x36"x10' Ingersoll Adjustable Rail
60"x48"x12' Ingersoll Adjustable Rail

DRILLS

No. 121 Baker, Motor Drive
No. 217 Baker, Motor Drive (1943)
No. D-8 Colburn, No. 6 M.T.
24"—6 Spdl. DEMCO
No. 2 LMS—26"—2 Spdl. L-G (1945)
No. 2 LMS—14"—3 Spdl. L-G
No. 2 LMS—20"—3 Spdl. L-G (1943)
No. 2 LMS—14"—4 Spdl. L-G
No. 2 LMS—26"—4 Spdl. L-G
No. 2 LMS—26"—6 Spdl. L-G
No. 2—8 Spdl. Leland-Gifford
7'-15" Col. American Full Universal
7'-15" Col. Carlton, Motor on Arm

TURRET LATHES

No. 2 B. & S. Screw Machine, Wire Feed
No. 601 Oster Rapiduction
No. 3 Jones & Lamson (1942)
No. 3 Bardons & Oliver, Bar Feed
No. 4 Gisholt (1942)
No. 5 Warner & Swaseys (1942)
No. 5 Bardons & Oliver (1942)
No. 5 Foster, Bar Feed (1942)
No. 6R Denver
No. 2A Warner & Swasey
18" Libby 3½" H.S.
No. 49-675 New Britain Gridley, 6 Spdls. 7½" cap.

HOR. BOR. MACHINES

No. 31 Lucas, 3" Bar
No. 3A Universal, 3" Bar
No. 360-F Giddings & Lewis (1942)
No. 560-F Giddings & Lewis (1942)

GEAR MACHINES

No. 7 Fellows Gear Shaper (1942)
11" Gleason Bevel Generator

PLANERS

36"x36"x12' Cincinnati, 4 Heads

MISCELLANEOUS

2500 Ton Lake Erie hydraulic press
Model H-7 Micromatic Vertical Honer
No. 22-C Racine Shear Cut Saw

VERT. BOR. MILLS

34" King
42" Bullard New Era
72" Cincinnati
72" Niles Extra Heavy
84" Betts, Motor Drive

GRINDERS

4"x12" Landis, Model H
6"x18" Norton Type C Plain (1943)
6"x30" Norton Type C Plain (1943)
10"x36" Norton Type C Plain (1943)
16"x72" Norton Type C Plain (1944)

10"x24" Landis Universal
12"x36" Landis Universal, Type LCH (1945)
12"x48" Cincinnati Universal

16"x16"x48" Thompson Hydro Surface
No. 22—12" Heald Rotary Surface
No. 25A—16" Heald Rotary Surface
No. 34 Abrasive Surface

10"x72" Colonial Broach GDR

Norton Motor Driven Plain Grinders
6"x18" ——— to ——— 240"

HILL-CLARKE MACHINERY CO.

647 WASHINGTON BOULEVARD
CHICAGO 6, ILLINOIS

GEAR CUTTERS

NEW • H.S. STEEL • FIRST QUALITY

INVOLUTE	**1P TO 48P**	**ALL LISTED**
BEVEL	**3P TO 24P**	**PITCHES**

LESS 50% DISCOUNT

SEND FOR OUR BARGAIN CIRCULAR

DEWITT TOOL CO., 173 Grand St., N.Y. 13, N.Y.

MACHINE TOOLS

Stevens Vertical Slotter, 4", 1941.
Conematic Chucking Machine 1⅝", 8-spdl.
52" Colburn Boring Mill, 2 hds. on rail.
#2 Colburn Drill Press, 1½" throat, #4 taper.
#14 Brown-Sharpe Cylindrical Plain Grinder.
13" LeBlond Heavy Duty Geared Head Lathe.

ELYRIA BELTING & MACHINERY CO.
ELYRIA, OHIO

FAY AUTOMATIC LATHE, 20" x 55" centers
CINC. VERTICAL MILLS, #2, #3 H.S. dial type
TURRET LATHE, #4, #5 Midland
PRESS, #4 Robinson O.B.I., 56 ton
PRESS, #24A Bliss, dbl. crank, gap frame, 71 ton
PLANER, Openside, Liberty, 36" x 36" x 8'
RADIAL DRILL, 5' Carlton, 13" column

AIR HAMMER, #100 Williams & White, Bates type
BORING MILL, 3" G. & L., rebuilt
COMPRESSOR, Sullivan, 500 CFM
DRILLS, 24" Cincinnati & 4B Edlund
No. 2 CINCINNATI CENTERLESS, new in 1942
Lathes, Sundstrand Stub, Gisholt-Simplimatic
SHAPER, 28" G. & E., heavy duty, 20" Kelly
UPSETTER, 5" Acme, steel bed

MACHINERY LIQUIDATING CO.
2308 W. Warren Ave. Detroit 8, Michigan

Chicago Steel Power Apron Brake 8' ½" cap. power clamp, M.D.
D. & K. Power Brake 10' 10 ga.
Bending Roll, Cap. 8' 5/16
4" National High Duty Upsetter, air clutch
4" Ajax Heavy Duty Upsetter, susp. slides
Ajax & Acme Upsetters, not susp. slides, ¾ to 3"
W. W. #29 Bulldozer 300-tons Cap., reversing clutch, M.D.
#PG-6 Ferracute Solid Back Press
#10 Erie Trimming Press; side shear, NEW
#62 Bliss Press, gap frame
2000-2500# Erie Model F Board Drop Hammer
Bradley Hammers all sizes
#12 Standard Auto. Drop Hammer
2½" 1-Sp. Landmaco Threading Mach.
2" 2-Sp. Landmaco Threading Mach.
#1½ National Maxipres, air clutch
#3 National Maxipres, air clutch
#G Cleve. Sgl. End Punch 48" throat; 2 thru 1"
22 Single and Double End Punches, various throat depths and caps.
Misc. Sheetmetal Machinery
Misc. Forg. Machine
Bolt, Nut & Rivet Machinery

DONAHUE STEEL PRODUCTS CO.
1919 W. 74TH ST., CHICAGO 36, ILL.

POWER SHEARS

96", 14 gauge cap.
72", 10 gauge cap.
52" & 72" 14 gauge cap.

AARON MACHINERY CO., INC.
45 CROSBY STREET NEW YORK 12, N. Y.

BOLTS NUTS SCREWS
all types immediate delivery
LAUREL SUPPLY CO. INC.
2380 Amsterdam Ave., N. Y. 33, N. Y.

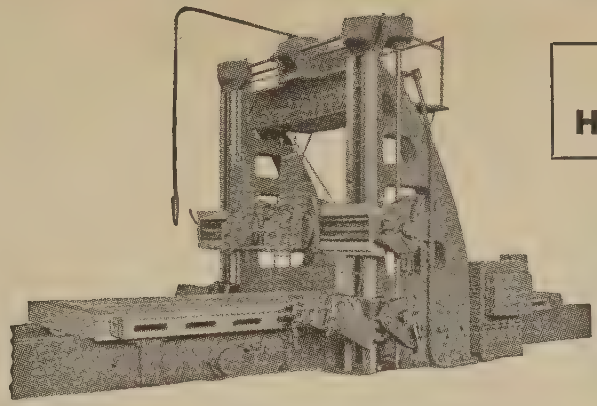
Tel. Washington Heights 7-7500

No. 1¾A Niagara Press, dial feed
Nos. OG and OOG B & S Automatics, high speed
No. 4 Noble & Westbrook Marking Machine
No. 5 Bardons & Oliver Turret Lathe, bar feed

D. E. DONY MACHINERY CO.
47 LAURELTON ROAD, ROCHESTER 9, N. Y.

96" x 72" x 25' NBP Double Housing Planer

2 RAIL HEADS
2 SIDE HEADS
REVERSING MOTOR DRIVE



36" OHIO UNI.
Heavy Duty Shaper

OTHER DOUBLE HOUSING PLANERS IN STOCK

72" x 56" x 20' CINCINNATI—2 HEADS
48" x 48" x 10' NBP—4 HEADS
30" x 24" x 10' GRAY—1 HEAD
30" x 30" x 8' CINCINNATI—1 HEAD

Find the Answer to Your Problems in Our Ever Increasing Stock

EMERMAN MACHINERY CORP.

875 W. 120th STREET
CHICAGO 49, ILL.

STOCK TOOLS

IMMEDIATE SHIPMENT

AUTOMATICS, 1⅞ & 3½" Cone, 4 spdle.
BORING MILL, 36" Bullard, "New Era"
BORING MILL, 72" Betts, 2 Hds., B.D.
BORING MILL, 16' Betts, M.D.
BORING MILL, Floor Type, Landis 3½ & 4" bar
BORING MILLS, Hor. 3" Universal Triway
BROACH, Hor. Hydraulic XA Oilgear, 60" stroke
BULLDOZER, No. 29T Williams & White
DRILL, Hvy. Duty, No. 513 Baker, No. 6 M.T.
DRILL, Radial 6' Carlton, M.D.
GEAR CUTTER, Spur 90" x 12" G & E
GEAR SHAPER, Helical, #75 Fellows, M.D.
GRINDER,, cyl. 14" x 72" Norton, M.D.
GRINDER, Internal, #72A5 Heald, M.D.
GRINDER, Knife, 120" Springfield, M.D.
GRINDER, Surf. No. 5 Abrasive, 14" x 48"
GRINDER, Surf. Hyd. "A" G & L, 14" x 18" x 72"
GRINDERS, Surf. #16 Blanchard, M.D.
GRINDERS, Vert. Surface P & W, 22" x 14"
HAMMER, Pneu. No. 6-B Nazel, M.D.
HAMMER, Bd. Drop, 1000#, Billings & Spencer
HAMMER, Steam Drop, 4,000 lb. Erie
LATHE, 24" x 16' Boye & Emmes, Grd. Hd.
LATHE, 27" x 18' N-B-P "Timesaver"
LATHE, 38" x 19' Putnam, Grd. Hd., Q.C.G., M.D.
LATHE, 42" x 50' Putnam, G.H., 2 carriages
MILLERS, Plain, Nos. 3, 4, & 5 Cincinnati
MILLER, Vert., No. 3 & 4 Cinci.
MULT-AU-MATICS, 12" Bullard, Type A, 6 station
PLANER, O.S. 36" x 36" x 12' Cleveland, 2 Hds.
PRESS, S-153 Ferracute, 150 Ton
PUNCH & SHEAR, No. 0 Ironton, 1¾"-1⅛"
PUNCH & SHEAR, "C" L & A, 2½-1½", 72" thr.
SHAPER, Vert., 10" Pratt & Whitney
SHAPER, 24" Stockbridge, M.D.
SHAPER, 32" Smith & Mills, M.D.
SHEAR, Bar, FV-75 Pels, 7⅝" rd.
SHEAR, Plate, 10' x 1½" Morgan, 26" gap.
SHEAR, Plate, 84 x ¼" Canton, M.D.
STRAIGHTENERS, Auto. ½" & ¾" Shuster

PARTIAL LIST

LANG MACHINERY COMPANY
28th St. & A.V.R.R. Pittsburgh 22, Pa.
Phone GRant 3595

The Company that lists prices for all machines advertised

LATE TYPE MACHINES

AUTOMATIC, New Britain, No. 49, M.D., ('43)	$1750.00
CRANE, 42' Span 7½ ton (1943)	2475.00
DRILL, 4 sp. Allen, M.D. (1943)	595.00
GEAR HOBBER, Barber Colman type S (1943)	1350.00
GRINDER, Surface, No. 2 B & S (1940)	875.00
GRINDER, #81 Heald Gagematic (1939)	1450.00
GRINDER, 72A3 Heald Gagematic (1939)	1375.00
GRINDER, 72A3 Heald Gagematic (1943)	1875.00
GRINDER, Heald 72A5 (1943)	2250.00
GRINDER, No. 34 Abrasive (1943)	1150.00
GRINDER, No. 16 Bryant (1943)	1675.00
LATHE, 12x4 Sidney (late), motor in base	675.00
MILL, Vertical, No. 2 B & S, M.D., (1943)	1650.00
MILL, Vertical, No. 4 Cincinnati H.D. (1943)	4500.00
MILL, 2-24 Cincinnati (1943)	1450.00
MILL, 3-36 Cincinnati (1943)	2250.00
MILL, 4-36 Cincinnati (1943)	3000.00
MILL, 2H K & T Plain (1943)	3500.00
MILL, Vertical Cincinnati #08 (1943)	775.00
MILL, (12) #12 Brown Sharpe (1943)	875.00
SAWS, Band (6), 14" Bett-Marr (New)	69.50
TURRET LATHE, 5D Potter Johnson (1943)	4250.00

MISCELLANEOUS

AUTOMATIC, #0 B & S, High Speed	950.00
AUTOMATIC, #0 B & S, 4000 serial	675.00
AUTOMATIC, #2 B & S	750.00
DRILL, Radial, 5' Cincinnati, 13" column, S.P.D.	1275.00
GRINDER, #1 B & S Universal	350.00
GRINDER, Surface, #2 B & S, M.D.	395.00
HOIST, 1 ton Ruger, hyd. (New)	295.00
LATHE, 14x6 Hendey, Grd. Hd., M.D.	875.00
LATHE, 14x6 Lodge & Shipley, Grd. Hd., M.D.	875.00
LATHE, 18 x 10 American	850.00
LATHE, 20x10 Boye Emmes, Q.C.G.	875.00
LATHE, 22x10 LeBlond, Grd. Hd., M.D.	975.00
LATHE, 24x10 Greaves, Grd. Hd., M.D.	1295.00
LATHE, 28x8 Bridgeford	1175.00
LATHE, 30x12 Putnam, Grd. Hd.	1275.00
LATHE, 36"x6' center Houston, Grd. Hd., M.D.	1475.00
MILLS (2) Hendey Lincoln type, M.D.	195.00
MILL, vertical, #1½ Milwaukee, S.P.D.	850.00
MILL, No. 2 K & T, motor in base, vert. hd.	1275.00
MILL, No. 3H LeBlond, plain	795.00
MILL, #3 Cincinnati, vertical, S.P.D.	995.00
MILL, #5 Cincinnati, plain, S.P.D.	1750.00
PLANER, 24x24x8 Hamilton	975.00
POLISHING LATHE, (2) Gardner No. 3D	150.00
SAW, Wood, Moak tilt. table	175.00
SHAPER, 22"x58" Cincinnati, Travel Hd.	975.00
SHAPER, 33" Smith Mills, S.P.D.	1875.00
SHAPERS, (2), 16" G & E, S.P.D.	950.00
SHAPERS, (2), 24" G & E, S.P.D.	1175.00
TURRET LATHE, No. 7 Foster, chucker, Univ.	275.00
TURRET LATHE, 2A W & S, bar feed	675.00
TURRET LATHE, Libby Type A, M.D.	350.00
TURRET LATHE, 5A Potter Johnson, M.D.	650.00

PRESSES—SHEET METAL MACHINES

FORMER, Cone, Bliss, M.D.	395.00
PRESS, #33 Consolidated	475.00
PRESS, #3 Consolidated, O.B.I., M.D.	795.00
PRESS, #3 L & J, O.B.I., M.D.	850.00
PRESS, #4 Consolidated, O.B.I., M.D.	1275.00
PRESS, #94 Consolidated, 40 ton	675.00
PRESS, 60 ton Styles type	675.00
PRESS, Hydraulic 60 ton HPM, steam platen	475.00
PRESS, Ferracute, 18 ton O.B.I. (New)	475.00
RIVETER, No. 9 Chicago, Hopper feed	875.00
ROLL, Power, 60" Wallace, 5" dia. rolls, M.D.	1450.00
SHEAR, 36" Frecut Square (New)	240.00
SHEAR, Stoll 42", ⅜" cap., M.D.	1450.00
SHRINKER, Metal Eng. Research No. 1447	95.00

WRITE FOR COMPLETE LIST!

VALCO Machinery Company 739-45 W. VAN BUREN ST. CHICAGO 7, ILLINOIS

MACHINES FOR YOUR YARD

Hughes Keenan Roustabout crane
Silent Hoist Krane Krawler
Int. I-4 with Hough shovel
Butler Carscoop
Browning 10 ton truck crane
Brownhoist gas loco. crane

TRACTOR & EQUIPMENT CO.
3507 W. 51st St. Chicago, 32

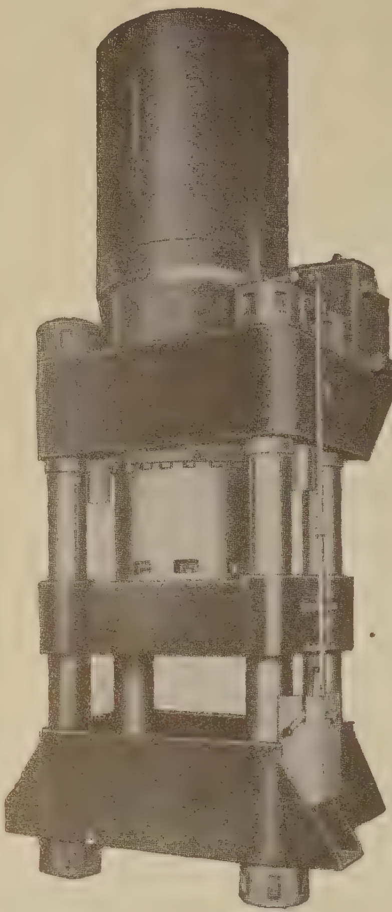
HEADERS

Bliss #6 Flywheel Type, DS, capacity ¾" x 4".
#412 New Britain Gridley 4 sp. Automatic Chuckers.
Cleveland 8 spindle Rigidturner.

Continental Salvage & Machinery Corp.
1836 Euclid Ave. Cleveland 15, Ohio

WE BOX MACHINERY FOR EXPORT

MIKE KRASILOVSKY
220 CENTRE STREET, N. Y. 13, N. Y. · Tel. Canal 6-1135



FOR SALE

1300 Ton Watson Stillman Hydraulic Press

Self Contained

Platen Size 48"x42"
Ram Diameter 35"
Stroke 22"
Opening 37"
Driven by 50 H.P. Motor
Speeds 650-10½-650 I.P.M.

Also

600 ton Elmes Press self contained, 48"x45" between rods, 36" stroke, 66" opening, 75 H.P. motor, 3 phase, 60 cycle, 220 volt.

600 ton self contained Double Action Press with 175 ton Cushion Cylinder. 48"x60" between rods, 30" stroke. 48" opening.

1320 ton self contained. Hydraulic Press and others.

AARON MACHINERY CO., Inc.
45 Crosby Street, N.Y.C. 12
Digby 9-1766

PRESSES FOR SALE

PERCUSSION PRESS Z&H #30, CAPACITY 900 Tons. Die space 16", stroke of slide 25", bed 36 x 40", belted M.D. with 100 H.P. 220/440/3/60 A.C. Motor.

AMERICAN CAN COINING PRESS, 2" stroke, bed 12 x 12", 10" shut height, capacity 600 tons, 7½ H.P. A.C. motor.

TOLEDO KNUCKLE JOINT EMBOSSING & COINING PRESS #666, 1000 ton capacity, bed 31 x 36", B.M.D. with 20 H.P. A.C. motor.

PERCUSSION PRESS #12 Z&H, capacity 150 tons, bed 17 x 17", 9" stroke, 18" between uprights, B.D.

FERRACUTE #SG-73 STRAIGHT SIDE, DOUBLE CRANK PRESS, Capacity 75 tons, 7½" stroke, bed 48 x 12", A.C. Motor.

ADJUSTABLE BED STRAIGHT SIDE, SINGLE CRANK PRESS, B.G. 4" stroke, bed 16 x 18", "V" belt drive, A.C. Motor.

DONAHUE STEEL PRODUCTS CO.
1919 W. 74TH ST., CHICAGO 36, ILL.

DOUBLE CRANK PRESSES

#4¼-36 V & O, tie rod, 6" stroke, single geared, bed area 28" x 36", shut height 18¼", capacity 65 tons.

#4-36 Bliss, 4" stroke, single back-geared, 24 x 36 bed area, 14¼" shut height, 60 tons capacity.

HAHN & BRANDT MACHINERY CO.
465 N. 5th St. Phila. 23, Pa.

FOR SALE

- 2—3", 1—4", 1—5" National Upsetter and Forging Machines, M D.
- 6—#2 Manville Screw Slotters, Hopper Feed, M D.
- 2—⅜ National Automatic Nut Tappers.
- 1—5' American Radial Drill, selected head, M D.
- 1—3' Cinn. Bickford Radial Drill, motor on arm.

M.T. Peterson Mchy. & Mfg. Co.
62 South Blvd. West Springfield, Mass.
Tel. 4-3727

BAR SHEAR

FV-75 PELS — SHEARING PRESSURE 1100 TONS Capacity at 65,000 lbs. T.S., 7⅜" round—7" square; 12" x 4⅛" to 16" x 3½" flat steel.

LANG MACHINERY COMPANY
28th St. & A.V.R.R. Pittsburgh 22, Pa.

PORTABLE AIR COMPRESSORS

2—60 CFM Worth. Contractor's Model, two-wheel, pneumatic tires, trailer mounted, 100# pres. New 1943.

PHILADELPHIA TRANSFORMER CO.
BOX 566 DALTON, PA.

---

(2) Clearing Power Presses Model F1200-42 1942. Like New. Capacity 200 ton, Bed 38" x 44" F.B., L.R., Strokes: 1 @ 26", 1 @ 30", 25 HP 3 phase AC & controls, Wt. 35,000 lb. All Steel.

Spot Delivery

KINGS COUNTY MACHINERY EXCHANGE
408 Atlantic Ave., Brooklyn, N. Y.
PHONES: TRiangle 5-5237, 5-5212, 5-5213
WIRE! PHONE! WRITE!

- National Bent Shank Nut Tappers—Battery of ⅝" and ⅞" Machines
- Waterbury Farrel Cold Headers and Thread Rollers
- Woodward & Powell 42" x 42" x 36 ft. 4 Head Planer
- Lucas No. 43 Precision Boring Mill, M.D.
- Cincinnati 36" x 36" x 16 ft. Planer, M.D.
- Bliss No. 1½, 1½B, 3½A, 3½B, 3½C, 4, and 16 Toggle Draw Presses

National Machinery Exchange, Inc.
128-138 Mott Street New York, N. Y.
"IF IT'S MACHINERY, WE HAVE IT"

COMPRESSORS — VACUUM PUMPS
STATIONARY — PORTABLE
ELECTRIC — GAS — DIESEL — STEAM
SALE OR RENT
New or Guaranteed Rebuilt
AMERICAN AIR COMPRESSOR CORP.
48th STREET & DELL AVENUE
NORTH BERGEN, NEW JERSEY
Telephone: Union 5-4848

POWER PRESS BRAKES

CINCINNATI 375 ton, 8' 8" overall, 6' 6" bet. housings, ⅜" cap.

CLEARING No. 90-10, 12' overall, 10' bet. housings, 10 gauge—New 1942.

Also

No. 4 Ryerson Comb. Punch, Shear & Coper.

PRATT & WHITNEY NO. 2A Jig Borer, No. 3644. With Equipment. New 1945. Barely used.

AARON MACHINERY CO., INC.
45 CROSBY STREET NEW YORK 12, N. Y.

FOR SALE

600 TON HORIZONTAL WHEEL PRESS
SOUTHWARK

96" BETWEEN TIE BARS. 15" RAM. 9' 3" BETWEEN RAM & RESISTANCE HEAD. 3 PLUNGER TYPE. DIRECT MOTOR DRIVE. A.C. MOTOR.

ADELPHIA EQUIPMENT COMPANY
341 North Third St., Philadelphia 6, Pa.

POWER PRESSES

BLISS, TOLEDO, V & O, ETC.
REBUILT—GUARANTEED

JOSEPH HYMAN & SONS
Tioga, Livingston and Almond Streets
Philadelphia 34, Pa.

MODERN
AIR COMPRESSORS

All Types and Sizes
Rebuilt-Guaranteed

EARL E. KNOX COMPANY
1111 Bacon St. Erie, Pa.

RE-NU-BILT

Guaranteed

ELECTRIC POWER EQUIPMENT

A.C. MOTORS

3 phase — 60 cycle

SLIP RING

Qu.	HP	Make	Type	Volts	Speed
2	1000	Whse.	CW	2300	720
1	900	G.E.	IM	2800	880
1	750	Whse.	CW	2200	327
1	450	G.E.	IM	440	506
1	450	Cr. Wh.	SR-31Q	2300	392
1	350	G.E.	MT-442Y	2200/4000	253
1	250	Whse.	CW-1106	2200	500
1	250	G.E.	MT-424Y	4000	257
3	200	G.E.	IM-16	440/550	435
1	100	Al. Ch.	ANY	220	485
1	75	F.M.	BY-H16B	2200	1750
1	60	Cr. Wh.	123AQ	220	700
3	50	Whse.	CI-638A	220	870

SQUIRREL CAGE

1	700	G.E.	KT	2200	705
1	500	G.E.	KF	2200	3575
3	600/450	Whse.	CS	2300	600/450
1	250	G.E.	IK	440	600
1	200	G.E.	IK	550	865
1	150/70	G.E.	IK	440	1170/870
1	100	G.E.	IK (Vert)	2200	450
1	100	G.E.	IK	2200	580
1	50	Rel.	IXM	2200	900

SYNCHRONOUS

2	900	Al. Ch.		2200	150
1	600	G.E.	ATI	600	900
1	600	G.E.	TS	2300	900
2	350	G.E.	TS	2200	150
1	85	G.E.	TS	440	1800

BELYEA COMPANY, INC.

47 Howell Street, Jersey City 6, N. J.

D.C. MOTORS

175 HP General Electric D.C. motor, type MD 109½, 520 RPM, sleeve bearing, complete with controls.

150 HP Electro Dynamic Motor, sleeve bearing, 230 volts, D.C., 250 to 500 RPM, type 75S, 3 bearing, complete with Monitor control reversing drum and switch.

mpc — MOTOR POWER COMPANY — QUALITY OUR BY-WORD

THE MOTOR POWER CO.
OF NEW YORK, INC.
859 Madison Avenue New York 21, N. Y.
RHinelander 4-6478

COMPLETELY REBUILT

MILLER, B & S #2A univ. hor. with vertical head, dividing head & 3/60/220 motor $2250.00

LATHE, American 24" x 10' geared head quick change, 8 speeds, 7.4 to 260 rpm, taper attachment, pan bed, 4-jaw ind. chuck, driveplate & 15 HP 3/60/220 motor $2495.00

MILLER, K & T #2B plain hor., double overarm, 3 arbors, SPD, 3/60/220 motor $1395.00

SURFACE GRINDER, Abrasive #3, 12" x 8" x 22", new magnetic chuck & rectifier 3/60/220 motor in base......$995.00

IMMEDIATE DELIVERY — ALL IN EXCELLENT OPERATING CONDITION

Inquire Today!

MORRIS SEGALL MACHINERY CO.
366 Forrest St., LExington 0534, Baltimore 2, Md.

---

551 KVA DIESEL ELECTRIC POWER PLANT

(3—187 KVA Diesel Gen.)
New 1946
used 75 to 100 hours

COMPLETE
IMMEDIATE SHIPMENT
at present
3 ph. 60 cy. 460 volts AC

Save Money
Really New Equipment!
Wire or Phone!

L. J. LAND, Inc.
Established 1910
152 Grand St., New York 13, N. Y.
Phone: CAnal 6-6976

Complete specifications, photograph, etc. can be mailed immediately.

---

230 VOLT Direct Current MONORAIL ELECTRIC HOISTS Floor Control

- 17—4000# Shepard-Niles, 12 foot lift, 26 feet per minute.
- 1—4000# Cleveland, type WH.
- 1—3000# Cleveland, type HEL, 17 foot lift, 28 feet per minute.
- 1—3000# Shepard-Niles, Model IXR, 14 foot lift, 37 feet per minute.
- 2—2000# Harnishfeger, form IXR, class R, 14 foot lift, 37 feet per minute.
- 2—2000# Shepard.

ALL LIKE NEW
Boxed, ready to ship

L. J. LAND, INC.
146 Grand Street, New York 13, N. Y.
Telephone No. Canal 6-6976

"ISP" MEANS MORE FOR YOUR DOLLAR in "ANYTHING containing IRON or STEEL"

Your Inquiries and Offerings are bound to Produce Much Better Results!

Our "Line"

- CARS: Freight, Industrial, etc.
- CAR REPAIR PARTS
- LOCOMOTIVES: Any kind
- PASSENGER-TRAIN CARS: Any kind
- RAILS: Relaying. Any delivery
- IRON & STEEL: Merchant
- SURPLUS, OBSOLETE and REJECTED STOCKS: New and used
- BUILDING & STRUCTURES: Steel
- CRANES: Ground, Overhead and Gantry. Also Runways
- POWER PLANT EQUIPMENT: Boilers, Generators, Turbines, Motors, etc.
- TANKS, STORAGE: All capacities
- EARTH HANDLING EQUIPMENT: Mixing, quarry contractors, etc., including motorized
- ABANDONED PLANTS, MACHINERY & EQUIPMENT
- SCRAP-IRON: Plain, Alloy, Tungsten, etc.

IRON & STEEL PRODUCTS, INC.
42 years' experience
13496 S. Brainard Ave., Chicago 33, Illinois
SELLERS BUYERS TRADERS

FOR SALE

Two six ton Electric Furnaces Heroult Type, one with 2500 KW Transformer, one without Transformer. Full description, price and terms upon request. Subject to prior sale or withdrawal from market.

ADDRESS BOX F-228
Care *The Iron Age*, 100 E. 42nd St., New York 17

MOTORS, GENERATORS, TRANSFORMERS

1 — 1500 H.P.
Bought and Sold
New and Rebuilt

ELECTRIC EQUIPMENT CO.
ROCHESTER 1, N. Y.

Betts Vertical Boring Mill 1943, 112" capacity, 2 Heads on rail. Heavy duty. Wt. 112,000 lbs. Automatic DC controls with 3/60/440 motor generator and controls.

Like New **Spot Delivery**

KINGS COUNTY MACHINERY EXCHANGE
408 Atlantic Ave., Brooklyn, N. Y.
PHONES: TRiangle 5-5237, 5-5212, 5-5213
WIRE! PHONE! WRITE!

LARGE STOCKS—QUICK SHIPMENTS

PUMPS, 30 gpm @ 1900 rpm (or 1.6 gpm per 100 rpm), 1¼" openings, built-in bypass, manual volume control, does not foam or aerate liquids and handles any viscosity without change to maximum of 100 lbs. p.s.i., Yale (& Towne) Model 20-DV, handles gasoline, lacquer and lacquer thinners, caustics, solvents, oils, alcohol, edible oils, coolants, varnish, molasses, etc., regular wholesale price about $50 each $42

NEOPRENE HOSE, 1⅛" size, 30 foot length, circular woven, wire inserted, semi-rigid construction, estimated to stand 250 lbs. p.s.i. pressure, made by Electric Hose & Rubber Co. to Government specification AXS-1054, regular wholesale price about $36, complete with male and female couplings, each $22

GASOLINE ENGINES, 1½ HP, Briggs & Stratton, final speed 1900 rpm through 1.39 ball bearing speed reducer to ¾" keyed shaft, Model NPR, complete with air filter and all standard equipment, each $60

J. A. POSTELL
936 West Peachtree St., N.W., Atlanta 3, Ga.

MOTORS GENERATORS
Large & Small
POWER EQUIPMENT
Send us your inquiries
CHAMPION ELECTRIC MOTOR CO.
187 Centre St., N. Y. C. M. Land, Prop.

MOTORS—CRANES—M. G. SETS

In Stock—Immediate Shipment—Rebuilt and Guaranteed

Engineered and Rebuilt By Specialists

OVERHEAD ELECTRIC TRAVELING CRANES

Tons	Make	Span	Current
3	Shepard	18′6″	230-VDC.
5	Northern	34′10″	220-VAC.
5	Northern	35′5½″	220-VAC.
5	Northern	36′1½″	220-VAC.
5	P&H	34′10″	230-VDC.

MONORAIL ELECTRIC HOISTS

Qu.	Tons	Make	Current
5	½	Shepard	230-VDC.
2	½	Lo-Hed	230-VDC.
3	½	Y. & T.	120-VDC.
1	1	Shaw-Box	220-VAC.
1	1	Wright	115-VDC.
1	2	Shepard	220-VAC.
1	2	Shepard	230-VDC.
1**	2	Shepard	220-VAC.
1*	2	Shepard	230-VDC.
4*	3	Lo-Hed	230-VDC.
1*	5	Lo-Hed	220-VAC.

* Fl. Op. 2-motor Hoists
** Pg. Op. 2-motor Hoists

SQUIRREL CAGE MOTORS 3 PHASE 60 CYCLE

QU.	H.P.	MAKE	TYPE	VOLTS	R.P.M.
7	10	Whse.	C.S.	440	575
1	10	G.E.	KT-753	440	850
1	10	G.E.	K-324	208	1750
1	10	Al.Ch.	X	220	1750
1	20	G.E.	I.K.	220	565
1	20	Whse.	C.S.	550	1750
1	25	G.E.	F.T.R.	220	575
2	25	G.E.	K.T.	220	900
1	25	Whse.	C.S.	220	1160
1	30	Whse.	C.S.	550	900
1	35	G.E.	I.K.	2200	1200
1	40	F.M.	H	220	860
2	40	Al.Ch.	A.R.	440	860
2	40	F.M.	B	220	1150
1	40	G.E.	K.T.	220	1800
1	40	Whse.	CS-659	2200	1760
1	50	G.E.	I.K.	440	695
1	50	Whse.	C.S.	220	870
1	50	G.E.	K.T.	440	1160
1	50	Ideal	A.T.	440	1750
3	75	Al.Ch.	A.R.	2220	1750
2	100	G.E.	L.K.	2300	695
5	100	F.M.	HS201C	440	900
4	125	Al.Ch.	A.R.	440	435
1	125	Whse.	CS-761	440	1750
3	125	Al.Ch.	A.R.	2200	1750
2	135	G.E.	KF512	440	1200
1	200	G.E.	I.K.	2300	490
3	200	G.E.	KG557Z	440	1750
1	200	Al.Ch.	A.R.	2200	3550
2	250	Whse.	C.S.	2200	1160

TRANSFORMERS OIL-COOLED

Qu.	K.V.A.	Make	Voltage	Ph.	Cy.
3	25	G.E.	1100/ 2200/ 608	1	40
3*	37½	Whse.	460/ 230/ 230/115	1	60
2	50	Wag.	132000/11880/ 575/287	1	60
3	130	G.E.	19000/9500/ 550/2200	1	60
6	165/247	G.E.	38100/22000/11000/430/215	1	60
1	200	Whse.	3810/ 2300/ 440	3	60
3	200	G.E.	2400/4500-Y138/230/460	1	60

MULTI-SPEED MOTORS

1—3-HP., Lo.-Allis, OMS-365, 220/3/60-Cy., 1750/1150/860/560-RPM.

1—15-HP., G.E. KT-543, 440/3/60-Cy., 865/580/430-RPM.

2—25-HP. Howell N-445, 440/3/60-Cy., 1770/1170/490-RPM.

8—20-HP. Reliance C504Y, 440/3/60-Cy., 1745/1150/875/570-RPM.

4—Allen-Bradley Encl. Auto Panels for above

4—G.E. CR7623Y1 Encl. Auto Panels for above

SYNCHRONOUS MOTORS

3-PHASE, 60-CYCLE

Qu.	H.P.	Make	P.F.	Volts	R.P.M.
1	80	Whse.	.8	220	1800
2	50	G.E.	.8	2200	600
1	60	G.E.	.8	440	1200
1	100	G.E.	.8	440	900
1	100	Whse.	1.0	2200	1200
1	150	G.E.	.8	440	900
1	150	G.E.	1.0	2200	900
1	150	G.E.	.8	2200	1200
1	500	G.E.	.8	2200	720
1	885	G.E.	.8	6600	514

CAN FURNISH ABOVE WITH EXCITERS, REDUCED VOLTAGE MAGNETIC OR SEMI-MAGNETIC OR FULL VOLTAGE MAGNETIC CONTROLLERS.

SLIP RING MOTORS CONSTANT DUTY

3-PHASE 60-CYCLE

QU.	HP.	MAKE	TYPE	VOLTS	RPM.
2	5	Al. Ch.	ARY	440	720
8	10	G.E.	I-M	220	1120
2	15	G.E.	I-M	220	1200
1	20	G.E.	MT-326	220	900
2	25	G.E.	MT-326	2200	850
4	25	G.E.	MT-526	440	900
2	25	WHSE.	CW-481	440	1750
1	80	Al. Ch.	ARY	440	900
1	30	WHSE.	CW	440	1160
1	40	Al. Ch.	ARY	2200	435
8	40	G.E.	MT-346	550	560
1	40	WHSE.	CW-644	220	870
8*	40	G.E.	I-M	600	1170
1	50	Al. Ch.	ARY	2200	490
2	50	G.E.	MT-536	2200	1200
1	75	G.E.	MT-548	440	1200
1	75	Al. Ch.	ARY	440	1750
1	100	G.E.	MT-356	440	900
2	125	G.E.	MT-558	2200	900
1	150	WHSE.	CW	2300	1200
1	200	C.W.	127AQ	440	590
1	200	G.E.	I-M	2200	580
1	250	WHSE.	CW	2200	580
1	800	G.E.	MT-412	2200	360
1	300	Al. Ch.	ARY	2200	514
1	300	G.E.	IM	440	580
1	300	G.E.	IM	2200	1200
1	400	WHSE.	CW-1108	2300	500
1**	1200	WHSE.	CW	2300	590

*—40-cycle　**—Heavy duty mill type

CAN SUPPLY THE ABOVE WITH PRIMARY CONTROL (OCB OR MAGNETIC) SECONDARY CONTROL (NON-REV. DRUM CONTROLLER OR FULL MAGNETIC) WITH STARTING DUTY OR VARIABLE SPEED RESISTORS.

MOTOR GENERATOR SETS

1—9 KW, G.E. CD, 250-VDC., dir. con. 15-HP. G.E. Sq. Cg. Motor, 220/440-V. 3-Ph., 60-Cy., 1800-RPM.

4—25 KW, Whse. SK, 3-wire, 120/240-VDC., 1200-RPM., dir. con. 40-HP. sq. cg. motor, 220/440-V., 3-Ph., 60-Cy.

2—3-Unit Sets, (2) 25 KW, Whse. SK, 3-wire gen. 120/240-VDC., 1200-RPM, dir. con. 75 or 100-HP. sq. cg. or syn. motor, 220/440 and 2200-V., 3-Ph., 60-Cy.

1—50 KW, Louis-Allis, 124/240-VDC., dir. con. 75-HP. Sq. Cg. motor, 220/440-V., 3-Ph., 60-Cy., 1200-RPM.

2—(NEW) G.E. 94 KW, 62½-VDC., Type CD generators, dir. con. 135-HP. Sq. Cg. motor, 220/440-V., 3-Ph., 60-Cy., 1200-RPM., generator and motor B.B., splash-proof.

1—100 KW, Al. Chal., 125-VDC. generator, dir. con. 150-HP. syn. motor, 2300-V., 3-Ph., 60-Cy., 900-RPM.

1—200 K.W. G.E. 250-VDC., 1200 R.P.M., din. con. 300 h.p. syn. motor 2300/3/60 cy.

T. B. MAC CABE COMPANY

4302 CLARISSA STREET　PHILADELPHIA, PENNA.

CRANES & LOCOMOTIVES

30 ton American steam locomotive crane. 70 ft. bm.

65 ton G.E. diesel electric locomotive. New 1942.

20 ton Davenport gas locomotive. New 1943.

80 ton American 6 wheel steam switchers. New 1944.

MISSISSIPPI VALLEY EQUIPMENT CO.

501 Locust St.　St. Louis 1, Mo.

CRANES, HOISTS AND REVOLVATOR

ONE TON, 2 MOTOR, SHEPARD CRANE, SINGLE I BEAM, MOTORIZED HOIST AND BRIDGE, FLOOR CONTROL, 220-3-60, SPAN TO SUIT, GEARED TROLLEY.

ONE 3 TON STATIONARY HOIST, 230V, D.C., SUITABLE FOR ELEVATOR CAR PULLER OR MOUNTING ON TROLLEY.

ONE 5 TON REVOLVATOR FOR MOUNTING ON CRANE HOOK, 230V, D.C., REMOTE CONTROL.

JAMES P. ARMEL

710 HOUSE BLDG.　PITTSBURGH, PA.
GRANT 4449

CRANES and HOISTS For INDUSTRY and CONSTRUCTION

N. B. PAYNE & CO., INC.

105 W. 55 Street　New York 19
Tel. Circle 7-6730

FOR SALE

Used Drels & Krump leaf bending brake ⅜" x 12'0" capacity—skidded for delivery.

H. R. FRIESE
SCHREINER STEEL PRODUCTS COMPANY
1127 S. Washtenaw Ave., Chicago 12, Ill.
Ked. 6170

OVERHEAD CRANES

1-TON
Curtis 24′ Span
Detroit 16′ Span
Detroit 18′6″ Span
Cleveland 38′ Span
Euclid 10′ Span
Shepard Niles 12′ Span

2-TON
Conco 12′ Span
Louden 19′2″ Span
Northern 28′ Span
P&H 31′10¾″ Span

3-TON
Shaw 51′2″ Span
Chicago Tramrail 27½′ Span
P&H 37′6″ Span
P&H 42′1½″ Span

5-TON
Alliance 95′ Span
Crane 76′ Span
Case 35′ Span
Detroit 34′ Span
Northern 32′ Span
Northern 22′ Span
P&H 31′10″ Span
P&H 72′1″ Span
Crane 37′3″ Span
Shepard 27′6″ Span

6-TON
Shaw 21′10½″ Span

7-TON
Charging & Quenching Crane 32′ & 36′ Spans

7½-TON
Northern 26′7½″ Span

8-TON
P&H 80′ Span

10-TON
Lane 60′ Span
Cleveland 51′3″ Span
2 Yd. Morgan Bucket Crane 60′ Span
Shaw 67′6″ Span
P&H 87′6″ Span
Shaw 80′9″ Span
Alliance 58′5″ Span
Lane 50′ Span

15-TON
Overhead Crane 74′4″ Span
Outdoor Crane 57′5½″ Span
Alliance 48′9½″ Span
New Albany 50′6″ Span
Morgan 82′ Span
Northern 76′ Span
P&H 40′ Span
Whiting 38′ Span

20-TON
Overhead Crane 60′ Span
Whiting 75′ Span
Shepard Niles 48′6″ Span
P&H 51′4″ Span
P&H 37′ Span

25-TON
Alliance 38′2″ Span
Bedford 67′8″ Span
Case 63′ Span
Overhead Crane 74′4″ Span

30-TON
Morgan 55′ Span
Northern 75′ Span

35-TON
Overhead Crane 74′4″ Span

40-TON
Niles 151′9½″ Span

50-TON
Alliance 52′ Span
Morgan 30′ Span

75-TON
64′8¼″ Span

Telephone us collect to discuss your requirements

ECONOMY COMPANY, INC.
49 Vanderbilt Avenue,
New York 17, N. Y.
Telephone: Murray Hill 4-1616

CORRUGATED ALUMINUM SHEETS

36 x 120 2½" corrugation 22-24-26 gauges

ALUMINUM ANGLES

1¼ x 1¼ x 3/32 x 11 ft.

COLDROLLED WELDED TUBING

22 ga. wall x ⅝ OD mill lengths

HARRISON SHEET STEEL COMPANY
4718 W. 5th Ave. Chicago 44

NEW *SURPLUS*

EMERY CLOTH—150 FT. ROLLS

1½″ Wide—$1.25 per Roll
#50 Grit
#80 Grit
#100 Grit
#120 Grit
#320 Grit
2″ Wide—$2.00 per Roll
#100 Grit
#120 Grit
#150 Grit
#320 Grit
Aluminum Oxide Cloth, 9″ x 12″ Sheets, #60 Grit, 1 Quire or 24 Sheets, $1.00

Victor Machinery Exchange, Inc.
251 CENTRE ST.
NEW YORK CITY — CANAL 6-5575

FOR SALE
Locomotive Cranes—
15-50 ton capacity

STONE *the* Crane Man
310 West End Ave. S. Detroit 17, Michigan

LIFTING MAGNETS

18", 20", 29", 36", 45", 55", also rectangular magnets, generators, reels, controllers.

Goodman Electric Machinery Co.
1060 Broad St. Newark 2, N.J.

F·H·CRAWFORD & CO. INC.
30 CHURCH ST.-NEW YORK
STEEL MILL
EQUIPMENT

FOR SALE CHEAP

Fabricated column Towers—40' to 60' in length. Made up of 2—10" Channels boxed with latticed flats. Ideal for ball park floodlights, radio towers, power lines, or many other uses. A perfect substitute for building columns also. Sacrifice at 4¢ per pound.

Write, Wire, Call

GLAZER STEEL CORPORATION
Telephone 4-8601
2100 Ailor Avenue Knoxville, Tenn.

FOR SALE STAINLESS STEEL SHEETS

Size	Type	Finish	Weight
.025 x 36 x 120	302	2D	38360
.025 x 33 x 84	321	2D	22000
.025 x 36 x 85½	321	2D	10650
.030 x 31 x 100	347	2D	3450
.031 x 24 x 96	302	2B	12172
.031 x 31 x 100	347	2D	14431
.031 x 36 x 110	347	#1	8000
.031 x 36 x 100		2D	1000
.032 x 31 x 112	321	2D	22,000
.032 x 48 x 120	302	2B	628
.035 x 36 x 108	321	2D	13600
.037 x 35 x 40	302	2D	16543
.040 x 36 x 120	316	2B	355
.043 x 36 x 120	302	2D	3816
.050 x 36 x 120	302	#1	44043
.050 x 36 x 120	302	2D	2056
.062 x 24 x 96	321	2D	7558
.0625 x 22 x 110	316	2D	5850
.090 x 34½ x 125	321	#1	6438
.093 x 36 x 75	302	2B	6596
.093 x 36 x 120	302	#1	25928

Seaboard Steel Company, Inc., New Haven, Ct.
Telephone 8-0929

PIPE

VALVES *and* FITTINGS
All Sizes in Stock
NEW—USED

GREENPOINT IRON & PIPE CO., INC.
Bogart, Stagg & Meadow Sts. Brooklyn, N.Y.

FREIGHT CARS

17—Gondola, Steel, 70-Ton, 46-Ft.
67—Gondola, All-Steel, 50-Ton, 41-Ft.
4—Gondola, Composite, 50-Ton, 48-Ft.
62—Hopper, Twin, All-Steel, 50-Ton.
7—Hopper, Quadruple, All-Steel, 70-Ton.
2—Hopper, Covered, 30-Ton, Equipped with Fuller Type Outlet Valves.
16—Box, 40 & 50-Ton, 40-Ft., Single Sheathed.
11—Ore, Hopper Cars, All-Steel, Cross Dump, 50-Ton.
20—Caboose, 8-Wheeled, Steel Sills.
60—Flat, 40 & 50-Ton, 33 to 48-Ft.
10—Flat, 40-Ton, 60-Ft.
9—Flat, 50-Ton, 58-Ft.
42—Dump, 20-Yd., Automatic Air.
31—Dump, 30-Yd., Automatic Air.
70—Refrigerator Cars, 40-Ton, 40-Ft.
1—Tank, Class 11, 3665 Gallon, Non-Coiled.

IRON & STEEL PRODUCTS, INC.

42 years' experience

New York Office
120 Liberty Street
New York 6, New York
Phone: BEekman 3-8230

General Office
13496 S. Brainard Ave.
Chicago 33, Illinois
Phone: BAYport 3456

"__ANYTHING__ containing IRON or STEEL"

FOR SALE

FREIGHT CAR REPAIR PARTS RELAYING RAILS STEEL STORAGE TANKS

THE PURDY COMPANY
122 So. Michigan Avenue
Chicago 3, Illinois

FOR SALE

100,000 sq. ft. 1½ #16
GALVANIZED EXPANDED METAL
48" x 96"
Low Price 4¢ per square foot

KINGSWOOD 5453
Baron Steel Company
STEEL PRODUCTS B
BARS · SHAPES · PLATES
4075 DETROIT AVE. TOLEDO 12, OHIO

WROUGHT Steel Pipe

FITTINGS
VALVES
BOILER
TUBES

ALBERT & DAVIDSON PIPE CORPORATION
2nd AVENUE . . 50th-51st STREET
BROOKLYN 32, N. Y.
Windsor 9-6300

LOCOMOTIVES

1—15-Ton, 0-4-0, Whitcomb, Gasoline, Mechanical, Standard Gauge.

1—20-Ton, Plymouth, Gasoline, 0-4-0, Standard Gauge.

1—20-Ton, Davenport, Gasoline, 0-4-0, Standard Gauge.

1—44-Ton, 360 HP. Vulcan, Diesel-Electric, Standard Gauge, New 1940, ICC Condition, 4 Motor Drive, Caterpillar Engine, T/E 27,280#.

1—87-Ton, 600 H.P. Diesel-Electric, Twin Unit Type. Can be operated as a 2-unit, 87-ton, or as two separate units 43½-Ton. In Good Operating Condition.

1—83-Ton, 2-6-2, Saddle Tank, Oil-Fired, Standard Gauge. A REAL BUY!!

3—85-Ton, 0-6-0, Coal-Fired, Steam, Locomotives. Standard Gauge, ICC Condition.

1—146-Ton, 0-10-0 Coal-Fired, Steam, Standard Gauge. ICC Condition.

1—Each, 4 and 6-Ton, and 2 8-Ton, Gasoline Mechanical, 24" Gauge.

PRICED TO SELL!!

IRON & STEEL PRODUCTS, INC.

42 years' experience

New York Office
120 Liberty Street
New York 6, New York
Phone: BEekman 3-8230

General Office
13496 S. Brainard Ave.
Chicago 33, Illinois
Phone: BAYport 3456

"ANYTHING containing IRON or STEEL"

FOR SALE

1—18 ton Plymouth std. ga. Diesel Locomotive. New 1941.
1—35 ton Davenport std. ga. Gas Locomotive. New 1942.
1—45 ton Whitcomb std. ga. Type 0-4-4-0 Diesel Electric Locomotive. New 1941.
1—60 ton G.E. std. ga. Type 0-4-4-0 Diesel Electric Locomotive. New 1941.
1—30 ton Browning 3G Steam Locomotive Crane. New 1941.
1—#6 Brownhoist Steam Locomotive Crane National Board Boiler.

B. M. WEISS COMPANY
Girard Trust Co. Bldg., Philadelphia 2, Pa.

ELASTIC STOP NUTS

all sizes—at less than factory prices

ALUMINUM RIVETS

ALL SIZES

MACHINE SCREWS, BOLTS, NUTS & WASHERS

for all manufacturing needs

Let us have your inquiries

BRENNER SUPPLY CO.
26 Somme St. Newark, New Jersey

AVAILABLE

Immediate Delivery From Stock
3—DAVENPORT Automatic Screw Machines, motor driven with equipment

WRITE *WIRE* *PHONE*

HASCO MACHINERY COMPANY
661 Frelinghuysen Ave. Newark 5, N. J.
Bigelow 3-3486-7-8

KAMIS ENGINEERING COMPANY
Designers & Manufacturers of Tools & Machinery

Special machine work; facilities available for production quantities of small, medium and large machined parts, assemblies and fabrications. Specializing in stainless steel aviation gas turbine parts.

Send for Brochure No. 3 which describes our facilities in detail.

300 MOORE STREET
PHILADELPHIA 48, PA.

LOCOMOTIVE

30-Ton Plymouth 1940

Standard Gauge—Gas Driven

LeRoi RX1-S 6 Cyl. 6¾ x 7 Engine

Phone *Wire* *Write*

NATIONAL METAL & STEEL CORP.
Dept. D, Terminal Island, Calif.
Phone: Los Angeles—NEvada 6-2571
Cable: NACOR

CARS

10—50 ton steel u/f Flat Cars
50—40 ton steel u/f Box Cars
25—40 ton 36' steel u/f Stock Cars
25—50 ton all steel drop door Gondolas
10—50 ton all steel Hopper Cars

LOCOMOTIVES

2—80 ton Lima switchers—steam
50 ton Porter switchers—steam
44 ton Davenport Diesel electric
70 ton Porter Fireless

RAILS

Complete stocks of various weights with angle bars, bolts, spikes, etc.

HYMAN-MICHAELS COMPANY
122 S. Michigan Ave. Chicago 3, Ill.

LOCOMOTIVE

50-ton Vulcan gas-electric, std. ga. Overhauled, with Am. couplers.

THE INDUSTRIAL EQUIPMENT CORP.
910 First National Bank Bldg.
Pittsburgh 22, Pa.

ACCUMULATOR & LOCOMOTIVES

2—FIRELESS 50 ton LATE MODELS.
1—PLYMOUTH 35 ton DIESEL.
1—AMERICAN 50 ton Saddle tank. 0-6-0.
1—PLYMOUTH 18 ton Gasoline.
1—SOUTHWARK 24" x 15' 1500# Accumulator Moving Ram—Latest Type. Like New.

CHARLES DREIFUS CO.
PSFS Bldg., Phila., Pa. Tel. Walnut 2-5050

RAILS

2,000 tons 90# prime relayers with angle bars and tie plates. Immediate shipment.

M. K. FRANK
480 Lexington Ave. New York, N.Y.
Phone: ELdorado 5-2885-6

RAILS

NEW AND RELAYING

Also—Track Accessories

BOUGHT — SOLD

Send us your inquiries and your offerings

STANDARD IRON & STEEL CO.
Knoxville, Tenn. Phones—4-2559
P.O. Box 458—Western Union WuX 4-3605

RAILS NEW AND RELAYING

TRACK ACCESSORIES *from* 5 *Warehouses*

- PROMPT SHIPMENTS
- FABRICATING FACILITIES
- TRACKAGE SPECIALISTS

EVERYTHING FROM ONE SOURCE

L. B. FOSTER COMPANY
PITTSBURGH CHICAGO
NEW YORK SAN FRANCISCO

RAILS

AND TRACK MATERIALS

NEW RAILS UP TO 100#
RELAYERS 60# AND HEAVIER
SWITCH MATERIAL—
SPIKES—BOLTS—TRACK TOOLS
—TIE PLATES
CARRIED IN STOCK

Complete Side Tracks

BUILDERS STEEL SUPPLY CO.
DEARBORN, MICH.
P. O. BOX 188 CEDAR 6000

RAIL
STEEL PLATE
STRUCTURALS, PIPE,
TUBING, WIRE ROPE,
FERROUS AND NON-FERROUS SCRAP

BOUGHT-SOLD LIQUIDATED

DULIEN STEEL PRODUCTS, Inc.
of Washington
9265 E. Marginal Way • Seattle 8, Wash. • LAnder 6000

New RAILS Relayers

All sizes and weights. Also frogs, switches, spikes, bolts, tie plates, contractors' and mill equipment carried in stock.

480 Lexington Ave., New York, N. Y.

M. K. FRANK
Reno, Nevada
Havana, Cuba

Park Bldg.
Pittsburgh, Pa.
Carnegie, Pa.

RELAYING RAIL

TRACK ACCESSORIES

MIDWEST STEEL CORP.
Gen'l Off. CHARLESTON 21, W. VA.
Warehouses
CHARLESTON, W. VA.
KNOXVILLE, TENN. • PORTSMOUTH, VA.

WANTED

THREAD ROLLING

MACHINE WANTED

1" Capacity x 6" length

HAYES STEEL PRODUCTS LIMITED

Merritton, Ont., Canada

WANTED

Strip Steel in Coils or Cut Lengths
Hot Rolled or Pickled and Oiled
Any Gauge or Size
Cold Rolled or Coated Finishes
Any Temper, Gauge or Size
Any Quantity, Large or Small

THE SHENANGO STEEL CO.

213 Staunton St., Farrell, Pa. Phone—6507

WANTED

4" #5.4 Channel 4' & Longer
3½" x 3½" x ¼" Angle 3 7/16" Multiples
⅝" HR Round 6" Multiples
1⅛" CF Round 4 11/16" Multiples
9/16" CF Round 3¼" Multiples

CLARKSVILLE MACHINE WORKS

Clarksville, Arkansas

WANTED

Stretcher for aluminum extruded shapes 15,000 to 25,000 lb. capacity.

Draw Bench for aluminum tubing & shapes 15,000 to 25,000 lb. capacity.

NATIONAL STORE FRONT CO., INC.

57 Cliff Street Roxbury 19, Mass.

Try the WANTED SECTION

for

"Hard-to-Find" Materials or Equipment

WEISS STEEL CO. INC.

600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS

Buyers of Surplus Steel Inventories

30 Years of Steel Service

WANTED

ROLL GRINDER

36" swing x 140" between centers with crowning attachment. Prefer late type.

EVEREADY SUPPLY CO.

803-5 Housatonic Ave., Bridgeport 4, Conn.

Air Compressors Wanted

Horizontal Water Cooled—100 CFM or larger; also
Gasoline or Diesel Driven Portable Machines

L. W. BAUER

North Bergen, N. J.

WANTED

Late type 72" x 72" x 20' or 24' openside or convertible openside planer—not older than 1940. Variable voltage drive 3/60/220, 2 rail heads, 1 side head (will consider 1 rail head). Prefer Cincinnati Hypro or Grey.

THE AETNA-STANDARD ENGINEERING CO.

275 W. Federal St. Youngstown 1, Ohio

WANTED

A 25 or 50 KVA Spot Welder with long arm in good condition.

PIERCE ENGINEERING CO.

OLEAN, NEW YORK

WANTED

STEEL TUBING AND PIPE

Give full particulars including price.

WALLACK BROTHERS

7400 So. Damen Ave., Chicago 36, Ill.

GROVEHILL 7474

WANTED

One 250 to 300 ton double crank, straight side press, Stroke — Minimum 12", Shut height — 35", Bed Area—L-R—60" F-B—24" minimum. Must be motorized and in good condition. Late model press preferred.

AGRICULTURAL DESIGNERS, INC.

Terminal Tower Cleveland 13, Ohio

WANTED

One annealing or heat treating furnace. 2,000 degree capacity. Inside dimensions approximately 36" wide by 24" high by 48" deep.

CALUMET STEEL CASTINGS CORP.

Hammond, Indiana

WANTED

#SF-2 U.S. Slide or Equal
One set of connections for feeding the above, back-to-front.
Two sets of 3/16" wire, stock straighteners.

WYTHE ENGINEERING CO.

600 Wythe Ave. B'klyn 11, N. Y.

BUSINESS OPPORTUNITIES

DESIGNERS AND INVENTORS

We are looking for a medium weight or small machine to manufacture and sell. Should be mostly of Cast Iron, as we have a Foundry and Machine Shop.

ADDRESS BOX F-178

Care *The Iron Age*, 100 E. 42nd St., New York 17

LOOKING FOR . . .

BUSINESS OPPORTUNITIES?

NEED . . .

CONTACTS or CAPITAL?

Read the Classified Section of

THE IRON AGE

WASHINGTON REPRESENTATION

HANDLING EXPORT,
FOREIGN AID PROGRAMS
AND
ALLOCATIONS

●

OFFERED TO MANUFACTURERS AND FIRMS ALL OVER THE NATION FOR A FEE YOU CAN AFFORD

●

FOR INFORMATION
WRITE OR CALL

●

INTERNATIONAL FACTORS, INC.

INTERNATIONAL BUILDING
1319 F STREET, N. W.
WASHINGTON 4, D. C.
Phone National 5721 or 4795

EMPLOYMENT EXCHANGE

EMPLOYMENT SERVICE

SALARIED POSITIONS. $2,500-$25,000. This thoroughly organized confidential service of 37 years' recognized standing and reputation carries on preliminary negotiations for supervisory, technical and executive positions of the calibre indicated. Retaining fee protected by refund provision. Identity covered and present position protected. Send only name and address for details. R. W. BIXBY, INC., 274 Dun Bldg., Buffalo 2, N. Y.

HIGH GRADE MEN—Salaries $3,000 to $25,000. Since 1915 thousands of Manufacturing Executives, Engineers, Sales Managers, Comptrollers, Accountants and other men of equal calibre have used successfully our confidential service in presenting their qualifications to employers. We handle all negotiations. Submit record with inquiry. The National Business Bourse, 20 W. Jackson Blvd., Chicago.

EMPLOYMENT EXCHANGE

HELP WANTED

GRADUATE MECHANICAL METALLURGICAL OR CERAMIC ENGINEER

25-40 years of age with knowledge of cupola and blast furnace experience for positions in engineering, research, and production of Rockwool products. State age, ambitions, education, qualifications and salary expected. Reply fully to

UNITED STATES GYPSUM COMPANY
Personnel Department
300 W. Adams St. Chicago 6, Ill.

MANAGER OF STEEL WAREHOUSES

Steel company needs manager for multiple steel warehouse division located in East. Must have sales experience cold rolled sheet products and administrative ability to direct organization. Salary commensurate with experience and ability. Give complete personal history and work experience in first letter.

Write Box 208, Suite 617
1457 Broadway, NYC

DISTRICT SALES MANAGER

Full responsibility for Northeastern territory office representing alloy steel producer. Prefer engineering graduate with outstanding record of accomplishment, ability to train sales organization, and technical knowledge of alloy steels. Give full details regarding age, experience, education, references and previous earnings.

ADDRESS BOX F-247
Care *The Iron Age*, 100 E. 42nd St., New York 17

TOOL ENGINEER required by established Connecticut manufacturer, with ten to fifteen years of practical experience in tool design. Should be familiar with tools for screw machines, turret lathes, foot and power presses and especially tools for metal strip forming and profiling. Write stating details of age, experience, education and salary expected, to—Box F-241, care *The Iron Age*, 100 E. 42nd St., New York 17.

OPPORTUNITY FOR EXPERT in Stainless Steel screwed fittings to connect with Stainless Steel Foundry. Applicants must know machining and technical details of full line of screwed and flanged fittings, no others will be considered. Participation woould be considered. Address Box F-256, care *The Iron Age*, 100 E. 42nd St., New York 17.

WANTED—ESTIMATOR for a well established steel fabricating plant in Metropolitan New Jersey. State age, experience and salary required. Address Box F-246, care *The Iron Age*, 100 E. 42nd St., New York 17.

CHIEF DRAFTSMAN for large structural steel fabricating company located in the Pittsburgh area. Excellent opportunity for high caliber man. Address Box P-151, care *The Iron Age*, 814 Park Bldg., Pittsburgh 22, Pa.

PERMANENT POSITION for Graduate Engineer—Structural Steel and Light Iron Estimator. Some structural design experience desirable. Plant in Eastern Pennsylvania. Address Box B-915, care *The Iron Age*, 100 E. 42nd St., New York 17.

HELP WANTED

CORE ROOM SUPERINTENDENT

Long established and successful company operates two foundries with common core room . . . Needs man of more than normal ability to administrate and supervise core room which employs one hundred persons . . . Must be 35 to 50 years of age and have basic core making experience . . . Excellent salary and steady employment . . . References required. Submit complete experience and recent photograph . . . All replies will be held in strict confidence.

ADDRESS BOX F-255
Care *The Iron Age*, 100 E. 42nd St., New York 17

ACCOUNTS WANTED

SALES ENGINEER wiith 12 years' experience in the Detroit and Michigan area desires additional account. Metal products for the automotive and refrigeration industries preferred. Address Box E-42, care *The Iron Age*, 103 Pallister Ave., Detroit 2, Mich.

SITUATIONS WANTED

PLANT ENGINEER, 51, graduate mechanical engineer, machinist, master mechanic, some industrial engineering, wishes position in metal working industry, in charge of construction, scheduled maintenance of manufacturing equipment, power and buildings; selection of standard and design of special electro-mechanical machines; to supervise engineering, drafting, machinists, plumbers, pipers, sheet metal workers, electricians, millwrights, carpenters, fire and police protection, power house operation, surveys and improvements, tooling, safety practice. Address Box F-253, care *The Iron Age*, 100 E. 42nd St., New York 17.

PERMANENT POSITION with responsibility wanted by a man 49 years old, who has had a total of about 30 years mechanical engineering experience covering detail, layout, design, supervision, liaison engineer and contact man. Prefer no board work. Will go anywhere. Must have positive assurance of permanent position. All information given must be held strictly confidential. Salary $450.00 per month minimum, depending upon living conditions. Address Box F-252, care *The Iron Age*, 100 E. 42nd St., New York 17.

TECHNICAL SALES EXECUTIVE—18 years' valuable experience with some of the nation's medium and large companies, also recent Government work principally on non-ferrous and light metals, desires consultant or managerial position. Energetic and ambitious to promote profitable sales. Address Box F-243, care *The Iron Age*, 100 E. 42nd St., New York 17.

Rates for Employment Service, Help, Representatives, Accounts and Situation Wanted Ads

These advertisements go to press on Wednesday for the following week's issue.

Employment Service Rates
Help Wanted Rates
Representatives Wanted Rates
Accounts Wanted Rates

Situation Wanted Rates
Situation Wanted Ads
Payable in Advance

COUNT SEVEN WORDS FOR KEYED ADDRESS

Set solid—50 words or less	$ 7.00	Set solid—25 words or less	$2.00
Each additional word	14c	Each additional word	8c
All capitals—50 words or less	$ 9.00	All capitals—25 words or less	$3.00
Each additional word	18c	Each additional word	12c
All capitals, leaded—50 words or less	$11.00	All capitals, leaded—25 words or less	$4.00
Each additional word	22c	Each additional word	16c

Display Advertising Rates Given on Request

DO NOT SEND cash through the mail. Use money order or check. ORIGINAL letters of recommendation in reply to advertisements—Copies will serve the purpose. Replies forwarded without charge.

ADVERTISERS IN THIS ISSUE

A

Aaron Machinery Co., Inc. 152, 154, 156
Adelphia Equipment Co. 156
Aetna-Standard Engineering Co. 161
Agricultural Designer, Inc. 161
Air Reduction 28
Ajax Electric Co., Inc. 92
Ajax Electric Furnace Corp. 92
Ajax Electrothermic Corp. 92
Ajax Engineering Corp. 92
Ajax Metal Co. 92
Albert & Davidson Pipe Corp. 159
Aldrich Pump Co., The 38
Allis-Chalmers Mfg. Co. 12, 13
Aluminum Co. of America 15
American Air Compressor Corp. 156
American Petrometal Corp. 147
American Wheelabrator & Equipment Corp. 91
Anderson, A. E., Construction Corp. 146
Armel, James P. 158
Armstrong-Blum Manufacturing Co. 129
Atlas Car & Mfg. Co. 48

B

Baird Machine Co., The 42
Baldwin Locomotive Works ... Front Cover
Barium Steel & Forge, Inc. 45
Barnes, Wallace Co., Div. Associated Spring Corp. 44
Baron Steel Company 159
Bauer, L. W. 161
Baush Machine Tool Co. 14
Belmont Iron Works 144
Belyea Co., Inc. 157
Bennett Machinery Co. 153
Bertsch & Company 146
Bethlehem Steel Co. 3
Bixby, R. W., Inc. 161
Botwinik Brothers of Mass., Inc. 150
Bradley, C. C., & Son, Inc. 144
Brenner Supply Co. 160
Bryant Chucking Grinder Co. 97
Builders Steel Supply Co. 160

C

Calumet Steel Casting Corp. 161
Calumet Iron & Supply Co. 27
Cattie, Joseph P., & Bros. 148
Champion Electric Motor Co. 157
Chicago Perforating Co. 148
Cincinnati Planer Co., The 30
Cincinnati Shaper Co., The 4
Clarksville Machine Works 161
Cleveland Steel Tool Co. 147
Cleveland Worm & Gear Co. Inside Front Cover
Climax Molybdenum Co. 141
Cold Metal Products Co., The 51
Continental Salvage & Machinery Corp. 155
Cowles Tool Co. 146
Crawford, F. H., & Co., Inc. 159

D

Danly Machine Specialties, Inc. 55
Delta Equipment Co. 152
Dempster Brothers, Inc. 122
Denison Engineering Co. 101
DeVlieg Machine Co. 127
DeWitt Tool Co. 154
Diamond Manufacturing Co. 145
Donahue Steel Products Co., Inc. 154, 156
Dony, D. E., Machinery Co. 154
Dreifus, Charles, Co. 160
Dreis & Krump Mfg. Co. 144
Dulien Steel Products, Inc. 160
Dykem Company, The 144

E

Eastern Machine Screw Corp. 148
Eastern Tool & Mfg. Co. 147
Economy Co., Inc. 159
Electric Equipment Co. 157
Electric Storage Battery Co., The 43
Elyria Belting & Machinery Co., The 154
Emerman Machinery Corp. 155
Erie Bolt & Nut Co. 126
Erie Foundry Co. 33
Espen-Lucas Machine Works 147
Eveready Supply Co. 161

F

Fafnir Bearing Co., The 37
Federated Metals Div., American Smelting & Refining Co. 21
Fellows Gear Shaper Co. 148
Follansbee Steel Corp. 47
Ford Chain Block Div., American Chain & Cable Co., Inc. 50
Foster, L. B., Co. 160
Frackville Shops Co. 150
Frank, M. K. 160

G

Gates Rubber Co. 34
General Electric Co. Apparatus Dept. 8, 10, 11, 16, 17
Gisholt Machine Co. 18
Glazer Steel Corp. 159
Goodman Electric Machinery Co. 159
Goss & DeLeeuw Machine Co. 148
Greenfield Top & Die Corp. 29
Greenpoint Iron & Pipe Co., Inc. 159
Griffin Manufacturing Co. 147

H

H and P Die & Stamping Co. 145
Hahn & Brandt Machinery Co. 156
Harnischfeger Corp. 123
Harrington & King Perforating Co. 147
Harrison Sheet Steel Co. 159
Harrison Radiator Div., General Motors Corp. 20
Hartford Steel Ball Co., The 144
Hasco Machinery Co. 160
Haskelite Manufacturing Corp. 31
Hayes Steel Products, Ltd. 161
Hayward Company 147
Hendrick Manufacturing Co. 126
Hill-Clarke Machinery Co. 154
Hubbard, M. D., Spring Co. 142
Hyman, Joseph, & Sons 156
Hyman-Michaels Co. 160

I

Indianapolis Machinery & Supply Co., Inc. 152
Industrial Equipment Corp., The 160
Inland Steel Co. 60
International Factors, Inc. 161
Iron & Steel Products, Inc. 157, 159, 160

ADVERTISERS IN THIS ISSUE

K

Kamis Engineering Co. 160
King, Andrew, Co., The 144
Kings County Machinery Exchange 150, 156, 157
Knox, Earl E., Co. 156
Krasilovsky, Mike, Inc. 155

L

L. & J. Press Corp. 147
L. & S. Bearing Co. 144
Land, L. J., Inc. 157
Landis Machine Co. 6, 7
Lang Machinery Co. 155, 156
Laurel Supply Co., Inc. 154
Leland-Gifford Co. 148
Lindberg Engineering Co. 103
Linde Air Products Company, The 26

M

MacCabe, T. B., Co. 158
Machinery Liquidating Co. 154
Madison Wire Co., Inc. 147
Malco Machinery Co. 155
Mesta Machine Co. 89
Michiana Products Corp. 148
Midwest Steel Corp. 160
Miles Machinery Co. 150
Milford Rivet & Machine Co. 124
Mississippi Valley Equipment Co. 158
Moline Tool Co. 124
Monarch Machine Tool Co. 110
Morey Machinery Co., Inc. 151
Motor Power Co. of N. Y., Inc. 157
Mundt, Chas., & Sons 146

N

National Business Bourse 161
National Machinery Exchange, Inc. 156
National Metal & Steel Corp. 160
National Steel Corp. 19
National Stove Front Co., Inc. 161
New Britain-Gridley Machine Div., The New Britain Machine Co. Inside Back Cover
New Jersey Zinc Co., The 143
Newark Gear Cutting Machine Co. 146
Nicholson, W. H., & Co. 146
Nilson, A. H., Machine Co. 144

O

Ohio Locomotive Crane Co., The 148
Ottemiller, Wm. H., Co. 147

P

Payne, N. B., & Co., Inc. 158
Peninsular Grinding Wheel Co. 24, 25
Peoria Malleable Castings Co. 144
Permanente Products Co. 40
Peterson, M. T., Mchy. & Mfg. Co. 156
Philadelphia Transformer Co. 156
Pierce Engineering Co. 161
Pittsburgh Gear & Machine Co. 142
Platt Bros. & Co., The 148
Post, Frederick Co. 145
Postell, J. A. 157
Purdy Co., The 159

R

Reading Chain & Block Corp. 46
Reliance Steel Div., Detroit Steel Corp. 36
Republic Steel Corp. 32
Reynolds Metals Co. 35
Ritterbush & Co., Inc. 149
Ryerson, Jos. T., & Son, Inc. 58

S

Schill, Edward Franklin, Corp. 152
Sciaky Bros., Inc. 53
Schreiner Steel Products Co. 158
Seaboard Steel Co. 159
Segall, Morris, Machinery Co. 157
Shenango Steel Co. 161
Shore Instrument & Manufacturing Co., Th 148
Simmons Machine Tool Corp. 153
Southern Galvanizing Co. 144
Standard Iron & Steel Co. 160
Standard Pressed Steel Co. 147
Stanley Works, The 148
Stearns Magnetic Manufacturing Co. 52
Sterling Bolt Co. 41
Stone, R. J. 159
Sun Oil Co. 95
Sunbeam Stewart Industrial Furnace Div. of Sunbeam Corp. 125

T

Texas Company, The 5
Thomas Flexible Coupling Co. 54
Timken Roller Bearing Co. Back Cover
Tinnerman Products, Inc. 49
Torrington Co. 145
Tractor & Equipment Co. 155
Twin Disc Clutch Co. 99

U

Union Carbide & Carbon Corp. 26
United Engineering & Foundry Co. 39
U. S. Electrical Tool Co. 142
United States Gypsum Co. 162
United States Steel Corp. 132
United States Steel Supply Co. 132

V

V & O Press Co. 147
Victor Machinery Exchange 159

W

Wallack Brothers 161
Washington Steel Corp. 56
Wean Engineering Co., Inc., The 9
Webb Wire Works 145
Weirton Steel Co. 19
Weiss, B. M., Co. 260
Weiss Steel Co., Inc. 161
Westinghouse Electric Corp. 22, 23
Wetherell Bros. Co. 148
Worcester Stamped Metal Co. 146
Wythe Engineering Co. 161

CLASSIFIED SECTION

Business Opportunities 161
Clearing House 149, 160
Employment Exchange 162
Sub-Contracting Parts and Sub-Assemblies Made to Order. See 1st & 3d Issues
Wanted 161

New Britain Model 365

does the job twice as fast by working from both ends at once

A NEW TOOL ROTATING DOUBLE END CHUCKING MACHINE

Fast Index, Power Chucking, Steady High Production

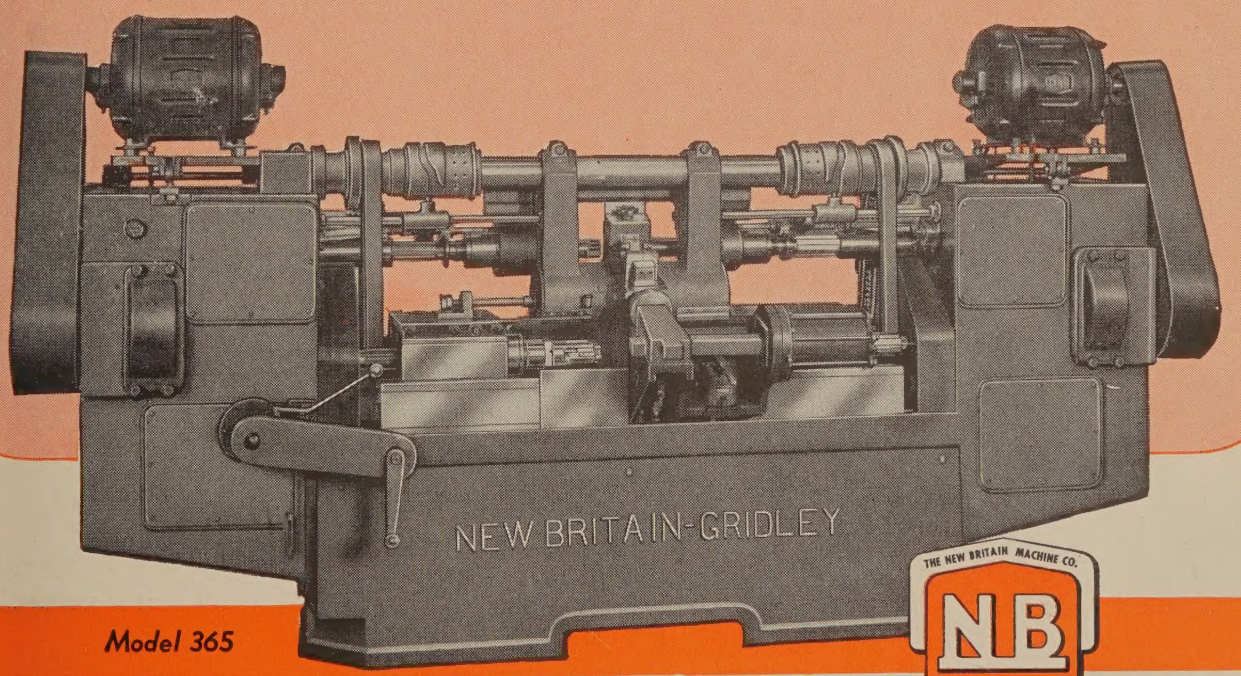
Featuring **1.** A four-chuck horizontal indexing turret with three work spindles on each side. One position for loading. Rough and finish bore, face, drill or ream in the first two positions; finish ream or thread in third position.

2. Over-all weight, power, and rigidity make possible the use of carbide tools and dampen any tendency to vibrate when running at high speed.

3. Anti-friction spindles mounted in positionable quills carried in slides to minimize overhang. Spindle speeds up to 2,000 RPM have been provided for fast machining of non-ferrous metals.

4. Ease of operation. Loading position is waist high. All controls within easy reach of operator. Automatic chucking quickly accomplished. Many types of pieces may be magazine loaded. Until fully inter-locked safety devices are satisfied, turret will not index nor tools jump.

5. High production. Rapid jump and drawback on all feeds. Total idle time of index - 1.67 seconds. Two pieces may be finished at one chucking on some jobs. Geneva motion index and locking mechanism completely enclosed and guarded against dirt and chips. Either lead screw threading or lead cam threading to take full advantage of self-opening dies or collapsing taps available in No. 3 position. Threading spindles may have different speeds and feeds and will reverse within closest limits on each successive cut.



Model 365

THE NEW BRITAIN MACHINE CO.
NB

NEW BRITAIN
Automatics
THE NEW BRITAIN MACHINE COMPANY
NEW BRITAIN-GRIDLEY MACHINE DIVISION
NEW BRITAIN, CONNECTICUT

THREE OTHER NEW MACHINES

Latest additions to the New Britain line include: The new, faster more powerful line of automatic screw machines designed to make the most of carbides on long and short runs, a new line of precision cam and air actuated contour turning and boring machines, and a new line of automatic turret lathes.

M-01063

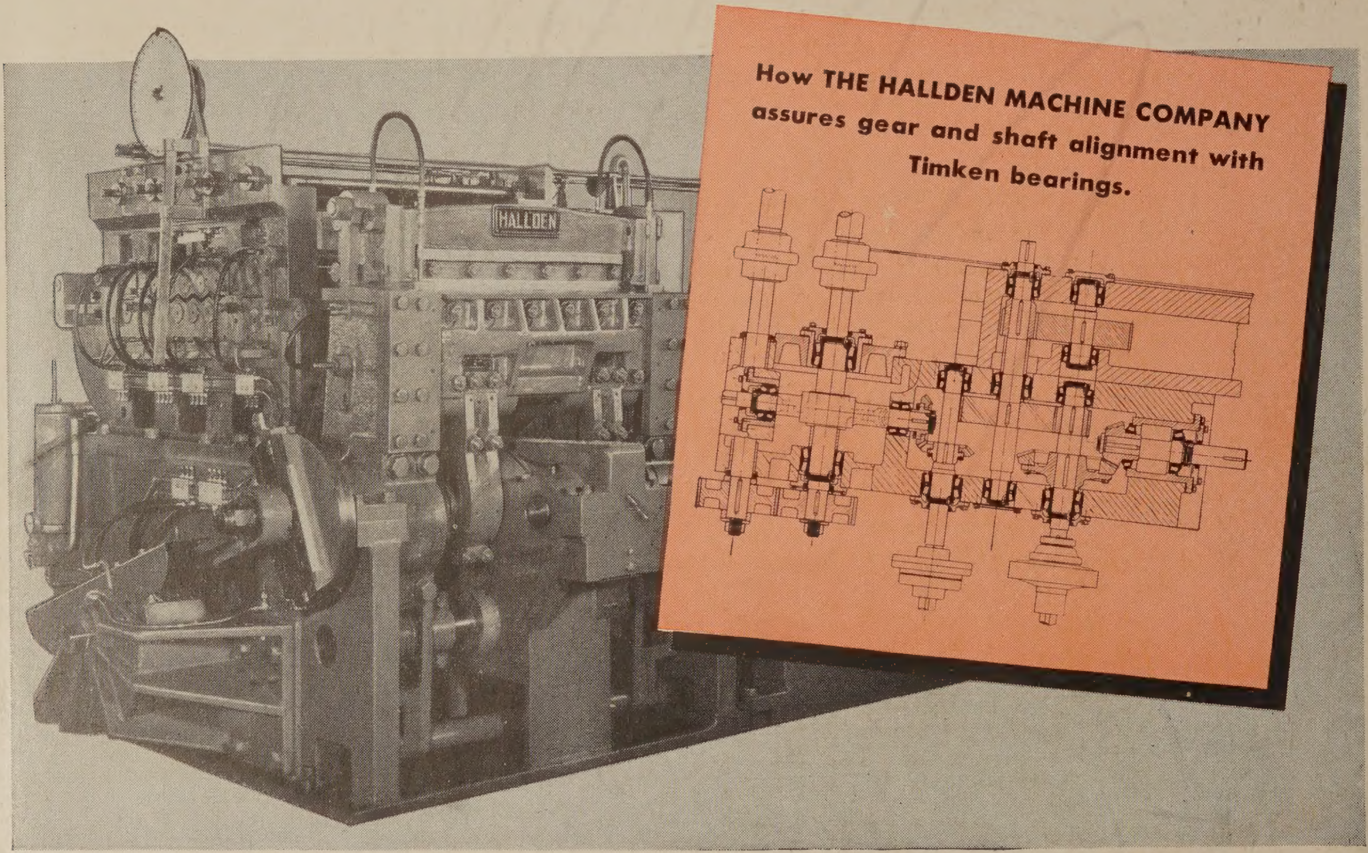
7 shafts, 11 gears—
kept in line by Timken bearings

THE Hallden Machine Company assures efficient power transmission in their guillotine flying shear through the use of Timken tapered roller bearings. Timken bearings hold shafts rigidly in line—keep gears in proper mesh. Maximum bearing capacity to carry the load of the shearing operation is provided in minimum space. Power is saved due to the friction-free operation of Timken roller bearings. Lubrication is simplified.

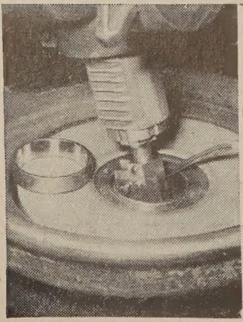
Timken bearings are tapered in construction—can carry any combination of radial and thrust loads. They're manufactured to incredible precision, finished to amazing smoothness. They permit closures which effectively retain lubricant, exclude dirt. The line of contact between rolls and races provides maximum load capacity. And since they're made of the finest bearing material ever developed—Timken fine alloy steel—Timken bearings last the life of the machine.

Remember, no other bearing can bring you *all* the advantages you get with Timken bearings—backed by 49 years of bearing research and development. That's why it's so important to make sure you have Timken bearings in every machine you manufacture or buy. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN BEARING EQUIPPED *This symbol on a product means its bearings are the best.*

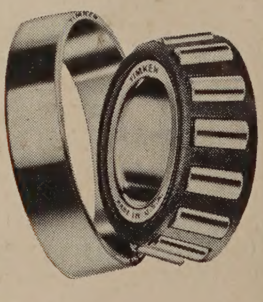


How THE HALLDEN MACHINE COMPANY assures gear and shaft alignment with Timken bearings.



FINISHED TO CLOSE TOLERANCES
Honing to incredible smoothness accounts for much of the precise, smooth rolling performance of Timken bearings. Timken is the only bearing manufacturer in the country which makes its own steel, and leads in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN
TRADE MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ↕ AND THRUST →↔← LOADS OR ANY COMBINATION ✳